DEPARTMENT OF
MINERALS AND ENERGY

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD 1976/93

1976

SUMMARY OF ACTIVITIES

OPERATIONS BRANCH

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EDITING AND INFORMATION SECTION

K.M. Kennedy, H.L. Higginson, W.H. Oldham, E.P. Shelley (part of year), M.E. Bartlett, A.G.L. Paine, J. Truswell, E.E. Young, G.M. Bladon, I.M. Hodgson, L.E. Walraven, L.C. Mundy, M. Harding (part of year).

Ken Townley retired at the end of 1975 because of ill-health. He had been in charge of this Section for about six years and earlier had been Chief Editor of the Geological Branch for many years. Ken died on 23 April 1976 as the result of a heart attack whilst visiting his homeland, England.

Throughout the year work continued to implement the changes to publications as outlined in Instructions issued during 1975. Progress was slow and although at the time of writing, no bulletins have been produced on A4 format and no reports presented as microfiche, contracts and processing of both are imminent.

A Treasurer's Advance of $56 900 was obtained to meet the 1975/76 expenditure for publications of $336 900. Financial constraints imposed for 1976/77 called for the setting of priorities for all publications; a computerised publications statement for all reports and maps was produced as a management document.

The first three issues of the newly launched BMR Journal came out on time and manuscript for the fourth number went to the printer on time (September).

Regular meetings on publications continued with Branch representatives and with the Australian Government Publishing Service.

Officers from the Editing and Information sub-Sections responded to the needs of the International Geological Congress held in Sydney during August 1976. A display was mounted and manned at the Congress.

E.P. Shelley (for January and February) and P.A. Smith (for the whole year) were seconded to work on the BMR Technical and Drafting Grades Review Team. K.M. Kennedy was a member of the Marine and Resource Assessment committees which reviewed activities of these areas and proposed forward program.

Editing Sub-section

All positions remained filled in 1976, with A.G.L. Paine seconded to the Sub-section. Editors continued with their areas or disciplines of responsibility; in particular A.G.L. Paine took over the AMI Reviews and the BMR Annual Report which is to be presented in a more popular version for 1976.

There was significant interruption to normal editing activities in the first half of the year when all editors, particularly W.H. Oldham, were involved in editing and marking-up all the IGC excursion guides, and checking the galley and page proofs.

The BMR Journal of Australian Geology and Geophysics was successfully launched as the main new project within the group, with J.F. Truswell as the editor. Numerous teething problems were overcome during the processing of the first four issues.

The whole group was involved in the preparation of the first draft of a new BMR Style Manual, covering all aspects of the preparation and processing of manuscripts for publication. J.F. Truswell is involved in the coordination of the final draft, which will be available early 1977.

An innovation in 1976 was the introduction of a computer printout of BMR manuscripts and maps in the publications pipeline. The print-out includes manuscripts to be written in the foreseeable future, being written, being edited, or in the printing process. The print-out includes manuscripts to be written in the foreseeable future, being written, being edited, or in the printing process. The print-out shows the author(s), title form of publication, and the current status of each map or publication. In addition, the group has prepared detailed publications financial programs, showing commitments, expenditure, and achievements. Because there will be insufficient funds to cope with the total publications program, Branch Heads prepared priority lists for printing.

K.M. Kennedy and H.L. Higginson attended a special meeting with the Director and Heads of Branches on 6 May to review variations in publications policy. It was decided that BMR will change to A4 page size for Bulletins. Un-numbered special publications will be issued for Bulletin quality material that cannot conveniently be presented on A4 pages. The present Report series will be gradually phased into a microfiche form. Individual Branch Heads will decide whether proposed records will be processed on file or as Records.

Other group activities included participation in the Publications Review Committee, Map Committee, and regular and special meetings with the Australian Government Publishing Service.

At the end of October 1976, there were 5 Bulletins, 11 Explanatory Notes, and 4 Reports awaiting editing; none of these is scheduled for printing in financial year 1976-77. Some editing has begun of manuscripts to be committed for printing in 1977-78.

Information Sub-section

Staff

E.P. Shelley returned to the Sub-section as supervisor at the end of February. P. Smith continued on special duties with the BMR Technical and Drafting Grades Review Team; Mrs L. Walraven acted in his position. Mrs M. Harding was attached to the Sub-section as a supernumary CA3 until early October. No further action has been taken on the proposal for additional clerical assistant positions in the Sub-section owing to staff ceilings.

Information services

Much of the group effort was directed towards the continuous flow of enquiries from Government, industry, and the public. Many enquiries can be answered simply and promptly by sending BMR publications or pamphlets, but some require research or considerable effort to obtain the desired information.

The group also acted as co-ordinator for BMR contributions to various publications such as the Newsletter of the NSW Committee for the Co-ordination of Geological Programs. The group revised articles for the Australian Information Service and provided updated material for the Minister's Questions Brief.

Press releases were prepared on various activities, data releases, and publications.

Information systems

The program of putting PSSA reports and BMR Records onto microform was still bending. Funds were made available for the work but by mid-November the Office of the Purchasing Commission had not arranged period contracts for microfilm services and the microfilm camera at the Australian Government Printing Office had a history of unreliability.

Several discussions were held, and agreement was reached with the Australian Government Publishing Service on the format of microfiche for publication.

Five desk-top microfiche readers were delivered early in the year. Funds were provided in the 1976/77 estimates for the purchase of further microform readers, a reader/printer, and a fiche duplicator. Delivery of these units is expected early in 1977. This purchase is part of a continuing program to make microfiche readers readily accessible to all BMR staff.

The decision to purchase the Hewlett Packard IMAGE data base management system brings up to a point where a number of information systems can be developed. Draft specifications for an index of BMR photos and slides have been prepared and an index of BMR publications and Records is proposed for development in 1977.

Developments relevant to national scientific and technical information systems were kept under review during the year. The first edition of the Australian Thesaurus of Earth Sciences and Related Terms was published early in the year and this will be used as the source of subject descriptors for most of the Bureau's information systems. The Sub-section is providing input to the Australian Earth Sciences Information System (AESIS) which is currently operated by the Australian Mineral Foundation. BMR provided some computing funds for AESIS.

The sub-Section continued to provide a consultancy service for BMR groups requiring advice on microfilm and information storage and retrieval.

Publications

Part 2 of the Catalogue of Publications, updated to June 1975, was issued. Drafts of the map sheets to replace the Pictorial Index were prepared and the first editions of these are expected early in 1977.

The 1975 Annual Report was prepared and issued; a new format for the annual report was approved by Heads of Branches.

The List of Coming Events and two supplememts were compiled and distributed within BMR and to some other geoscience organisations. Distribution of BMR Records continued throughout the year.

BMR Symposium

The 5th BMR Symposium was held on 28-29 April and was attended by 160 persons from industry, tertiary institutions, and state surveys. This attendance was up 60% on 1975. The Harold Raggatt award for the best paper was shared between R.S. Needham ('The Cahill Formation - host to uranium deposits, Alligator Rivers region') and J.B. Willcox ('The structural evolution of the Great Australian Bight Basin'). The 6th BMR Symposium is proposed for 3-4 May 1977.

Displays and visits

Regular changes were made to the displays in the foyers and showcases. A display was mounted at the Academy of Science during the BMR Symposium and featured various aspects of some of the talks which were given.

A considerable amount of time was expended in the design and construction of the BMR display at the 25th International Geological Congress in Sydney in August. Themes which were featured were Antarctica, Uranium, Tektites, BMR activities and the new 1:2½M Geology of Australia map.

There were few visits by schools during the year, but a large number of written requests for brochures and other information was received.

LIBRARY

M.A. Thompson, S.M. Attwood, M. Murnieks, R. Davidson (part of year), M. Pearce (part of year), J. Tait, L. Woods, G. Lohse, M. Dawes

Performance Statistics	(November 1975 to October 1976)	
Loans	11 137	Almost equal to last year's figure of 11 143.
Serials Circulation	15 400	A drop of 22% on last year's figure of 19 718, owing to suspension of serial circulation 16 September - 31 October '76.
Inter-library Loans		
Requested from BMR	2 199	A rise of 36% on last year's figure of 1608, despite the 2 months we suspended I.L. Loans. This would indicate that other libraries saved up their requests until we resumed this service.
Requested by BMR	679	A drop of 11% on last year's figure of 759.
Reference Searches	676	A drop of 17% on last year's figure of 812.
Cataloguing (new and revisions)		
Books, pamphlets and maps	1 266	A drop of 9% on last year's figure of 1 390. This year Mrs Murnieks has given part of each day to the organization of the monograph shelves, to the benefit of staff and readers.
Serials	351	A drop of 25% in last year's figure of 466 owing to Mrs Thompson's dual role as Librarian-in-Charge and Serial Cataloguer.

Number of Signatures in Library Visitors' Book during the year:-

November	4	
December	6	
January	8	
February	15	
March	23	
April	30	
May	26	
June	19	
July	9	
August	33	(because of IGC?)
September	24	
October	32	
	229	

The actual number is in excess of this figure, as some visitors omit signing the book. Staff do, however, request visitors to sign on most occasions.

This year may be summed up as one of cuts in services owing to shortages of staff and funds. Of the three librarian positions, that of Serial Librarian has remained unfilled throughout the year. For two months one of our two library officer positions was vacant, that of Inter-Library Reference Officer, and all inter-library loans were suspended. For 139 man-days, during which clerical support staff was on sick or recreation leave, no relief staff could be provided owing to the shortage of clerical assistants in BMR. As a result serial circulation was suspended indefinitely from 16 September, and reference work was affected, showing a drop of 17% on the previous year's figures. Shortage of clerical and professional staff has resulted in the following arrears of work:

* 1056 stencils (for catalogue cards) to be duplicated
* 2500 cards to be filed into the catalogues
* 400 monographs to be catalogued
* 500 Serials to be catalogued

These arrears are expected to grow while the Library is under-staffed.

No photocopying of library material was carried out from 17 February to 28 April owing to lack of funds. No orders were placed for monographs from 2 January to 28 April for the same reason, although orders were prepared during this period and processed as soon as the ban was lifted. The same situation applied to binding. A new catalogue cabinet has been requested but approvals have not yet been obtained. This is delaying the commencement of a new subject catalogue using the Australian Thesaurus of Earth Sciences and Related Terms which provides a better subject coverage for our readers than the present subject catalogue which uses Library of Congress subject headings. Additional space is also urgently needed for the continually growing Author-Title and Serial Catalogues, and the Library's set of the Stratigraphic Index.

Space is in short supply, as is the case in most libraries. Microform is seen as at least a partial solution. The Library has acquired two microfiche readers during the year; one is also a printer, but this was not operational. One of the microfiche readers was frequently out on loan to other sections of BMR, thus highlighting the need for more microfiche readers in BMR. The Library's holdings of microform are increasing; during the year fourteen microfilms and twelve microfiche were catalogued. A considerable number of such items is in the arrears of material awaiting cataloguing.

An increasing number of visitors used the Library and complimented the Bureau on the scope of its holdings; they made use of items that are not available at any other earth science library in Australia.

During the year a questionnaire was sent out with the 'List of Additions to BMR Library' which is mailed to over eighty individuals and organisations. The purpose of the exercise was to determine what use was made of the list and whether recipients still wished to receive it. About sixty replies were received of which only ten said they no longer wished to receive the list. Library staff were encouraged by the variety of ways in which the list is found useful.

ADP APPLICATIONS SECTION

A.J. Barlow, D.W. Kerr, J.T. Brown, E.L. Smith, F.D. Newman, R. MacDuff, P. Elliot, W. de Courcy Browne, A.R. Alps, L. Wooton, M.J. Ford, W. Bridge

General

The ADP Applications Section continued to provide services and continue development projects similar to the pattern set in 1975. The main functions comprise the consulting service to users outside the section, development of new systems, and management of BMR ADP facilities including data preparation, CSIRO computer network node and terminals, the laboratory data acquisition system, and two facilities at ANU. The two ANU facilities consist of software development for a high resolution ion microprobe and maintenance/upgrade of the mass spectrometer data acquisition system in the Research School of Earth Sciences.

The service provided by the CSIRONET computer network has continued to be poor, particularly in regard to reliability of the system hardware; there has also been a number of major changes to operating system software. These factors have considerably increased the workload on the consultant Computer Systems Officer. There has been some improvement in the operation of the magnetic tape facilities. New tape transports installed late in 1975 have eliminated many tape-reading faults attributed to the tape hardware. A new tape-handling system has also been implemented and, though not yet completely satisfactory, has reduced tape losses and improved turn-round time.

The amount of processing carried out on the CSIRO computer was severely limited during the first half of the calendar year owing to shortage of finance. This was due to a particularly heavy workload in the latter half of 1975 and the 25% increase in charges imposed from the beginning of the financial year. It was expected that this extra cost would be covered by supplementary appropriations, but the present economic policy allowed only a very small proportion of these costs to cover only the most urgent processing. A reasonable appropriation for 1976-77 allowed normal processing to be resumed in June. Usage has continued to be lighter than expected owing to staff decreases but further escalation of CSIRO charges may cause financial problems before the end of the year.

Staff

Some improvements in the staff organisation of the Section have occurred during the year. The two Programmer Class 6 positions were upgraded to Computer Systems Officer Class 2 and the Programmer Class 8 to Computer Systems Officer Class 3. In addition, a position of Senior Computer Operator Grade 1 was created to formalise the increased level of duties performed by the operator on the Hewlett Packard system. The Computer Systems Officer Class 3 position which has been vacant since October 1975 was filled but this officer will not effectively take up duty in the position until the end of this year. A Computer Systems Officer Class 1 recently graduated from cadetship has been seconded to the Bureau and action is being taken to formalise his position. The total complement of staff, however, is still inadequate to meet needs of user groups.

The service facilities provided to user groups in addition to the consulting and advisory service include data preparation, node operation, preparations of submissions to the Interdepartmental Committee on ADP, conversion of programs written by external organisations to the Cyber 76, and liaison with Division of Computing Research on CSIRONET system problems.

Major Projects

The Section was involved in four main development projects:

1. Investigations and implementation of systems for information storage and retrieval.
2. Implementation of the Georgina Basin field geological data base.
3. Design and implementation of a seismic data presentation system.

4. Investigation of computer editing and use of the COM (Computer Output to Microfilm) facility for BMR publications.

Two other important projects originally scheduled for 1976 have been deferred. These are the computerized system for the Stratigraphic Index and the automated cartography project.

Information storage and retrieval

During 1975, it became evident that a proposed feasibility study on BMR information storage by a commercial consultant would not be proceeded with. Towards the end of 1975 the ADP group indicated an investigation into means of best meeting BMR requirements for information storage and retrieval. In the absence of capacity to undertake the installation of a major integrated system, it was decided that there was a number of individual areas where the application of a computerized data base would be appropriate. A study of the best means of implementing these systems was commenced but on a part-time basis. It was felt very early in the study that it would not be desirable for the Bureau to undertake the writing of a special software for this application partly because of lack of programming capacity but also because the availability of a number of packages already developed both for general applications and also by geological institutions in Australia and overseas.

Some of the more geologically oriented systems were looked at but were generally discarded on the grounds of specialised application only, inadequacy, or difficulty in converting to the Cyber 76 computer or other readily available systems. Two packages already available on the Cyber 76 were also reviewed, viz. INFOL and FORDATA. INFOL has been used by BMR officers for several small to medium-size systems but suffers from a number of deficiencies. INFOL is a sequential system and therefore inherently unsuitable for ad hoc retrieval; a number of its facilities had not been converted from the original system to the Cyber 76 and it also still contains a number of faults. These all lead to the package being expensive to run and uneconomical for BMR applications. FORDATA is a CSIRO-designed system and is potentially useful for our applications, but it requires considerable programming effort to implement and is not portable i.e. cannot be used on other machines and is still subject to further design modification.

Of the commercially available packages, the two selected as most promising were SYSTEM 2000 and TOTAL. These have the advantage of being usable on a number of machines and are available to a large number of users. SYSTEM 2000 appeared to be the more appropriate and some tests were made at the Australian Bureau of Statistics. Some of the expected advantages were not realised, and also the possibility of the system becoming available in the Cyber 76 became remote.

TOTAL is not presently available on any Canberra computer system but a new version of IMAGE became available for use on the BMR Hewlett-Packard computer system. IMAGE is basically identical to TOTAL but is restricted in some specifications. However, it has the advantages of being immediately available, simple to implement, and involving no external direct costs except for the basic purchase of software, the cost of which is quite small. Obviously, however, it will increase the demand on internal resources but it is believed that at this stage these can be met easily. Three small tests data bases have been designed and implemented and further studies are continuing. The system looks promising despite the restrictions at this stage and can be converted easily to TOTAL and possibly FORDATA later if necessary.

Georgina Basin project

The Georgina Basin Project storage and retrieval system was started in April 1974 and now comprises 2776 sets of field observations and related data totalling 3.5 million characters. In Addition to the field observations, 595 geochemical analyses, 191 sets of faunal determinations and 39 detailed carbonate petrographic reports are available. About 500 sets of field observations from the 1976 field season are being processed for addition to the file.

The file, an INFOL 2 system, is a pooling of the information from geoscientists' field notebooks and information on drill-core samples. Laboratory analyses are added as they become available. Each geoscientist receives a hard copy of the data he collected and each has access to any data on the file.

Input to the system is in free-field format with some standardisation of data entry in a few fields or parts of fields. Output reports may be obtained through the automatic report generator or they may be optionally formatted. All or part of the file may be obtained on microfiche.

Input/output procedures have been documented and the system is in routine operation. Procedures are being established to provide digitized input to, and plotted output from the file.

Seismic data presentation project

This project is now at the production stage. The design and implementation have taken longer than expected owing to the resignation of the Programmer Class 8 late in 1975. The project incorporated relevant subroutines written by officers of the Geophysical Branch Marine Section. The object of the project is to provide machine contouring of subsurface structural contours from seismic and well-log data.

Computer editing and use of COM

This project has just commenced and involves the production of some BMR publications using on-line and off-line computer editing facilities. The raw draft publication is typed into a visual display-cassette terminal. Basic error correction can be done off-line using the cassette terminal, and justification, paging, and output can be handled by the computer and COM facility. This project is still in the feasibility study stage and it may be found that the process is uneconomical or unacceptable at least in part. It also has an obvious role in producing publishable reports from the computer-based information systems.

Hewlett Packard computer system

The Group concerned with the HP-2100 computer data acquisition system has continued to improve the available facilities on the system and has implemented several new ones. Additional equipment has been added including a 15 Mbyte moving-head disc, a graphics display terminal, a second central processing unit with 32K words of memory, Olivetti console terminal, and a casette tape deck. The integration of these items has incurred considerable work in software writing for computer communication and drivers for the non-standard peripherals. Some hardware design in interfacing was

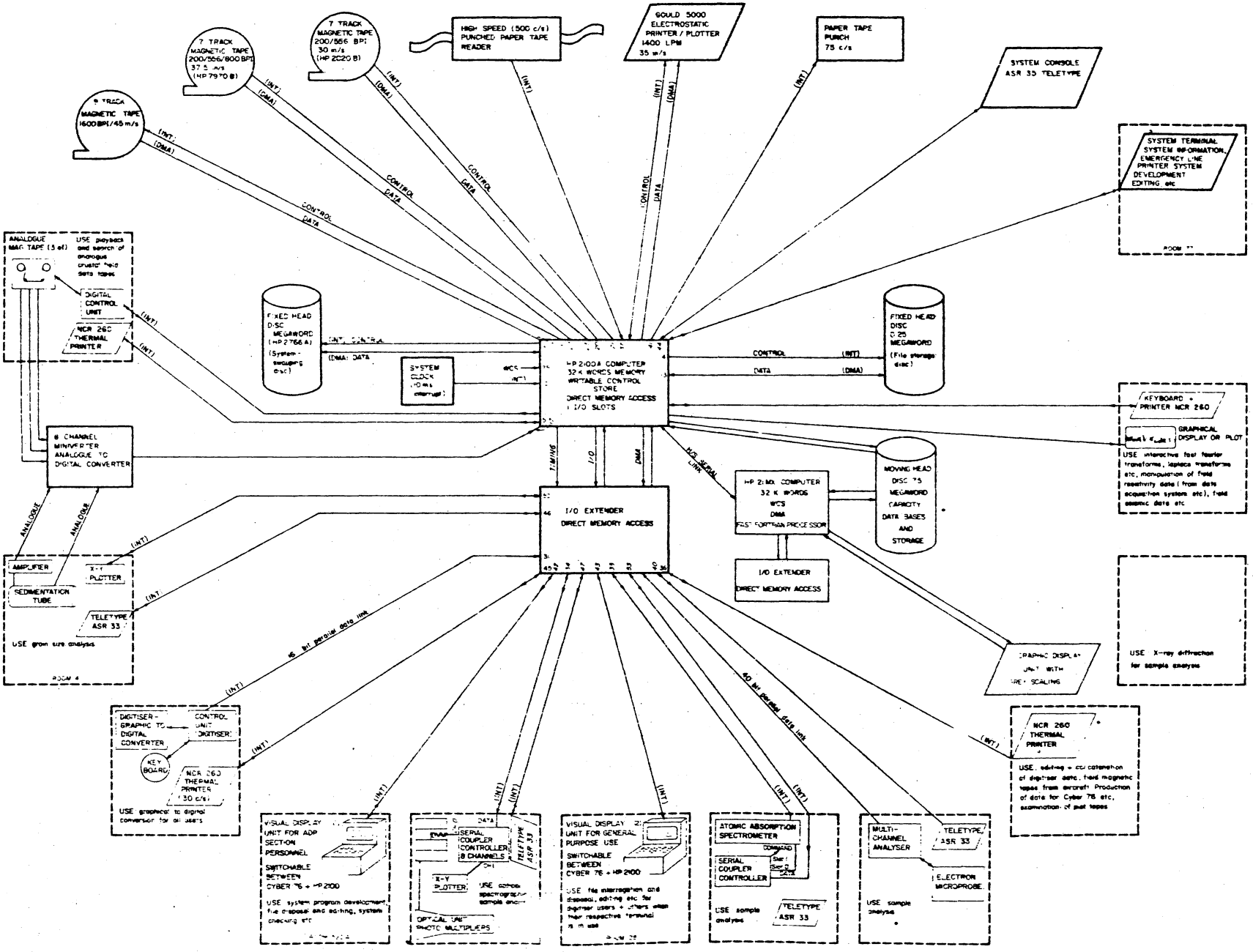
also necessary. Other hardware design was involved in relation to a link to the electron probe/multichannel analyser and a new set of amplifiers and demodulators for the sedimentation tube equipment. This latter item has resulted in a considerable improvement in data quality. The present configuration of equipment is shown in Figure 1.

Integration of the new disc also involved the upgrade of the operating system from RTE 1 (Real Time Executive Operating System 1) to RTE 2. This was necessitated by the incompatibility of this model disc with RTE 1 and also the cessation of Hewlett Packard supprot for RTE 1.

During the year the terminal and spooling software was upgraded and additional utility programs were provided for users. Improvements were made to the plotting facility for BMR aircraft field tapes. The Group also undertook to produce archive-quality tape copies for the Geophysical Marine Group. This also entailed some software writing to ensure compatibility with the Cyber 76 system.

Because of the financial restrictions in the first half of the year a number of users including Engineering Geophysics, Seismic, Observatory, Petroleum Exploration Branch, Palaeomagnetic and Mining Engineering Section used the HP-2100 system in preference to the Cyber 76. This incurred considerable time in giving advice and assistance. Assistance has also been given to officers working on three separate field acquisition systems. Some of these officers attended a four-weeks in-house course on ASSEMBLY programming and Hewlett Packard computer architecture given by the geophysicist in charge of the Group (D. Kerr). Assistance was also given in implementing the IMAGE test data bases. Work commenced on software development for the high-resolution ion microprobe at the Research School of Earth Sciences and assistance was given with the mass spectrometer data acquisition system; it is hoped to upgrade the software for this latter system in 1977.

The Geological Branch electron probe system is now 98% complete and is waiting only on calibration constants.



BMR HP-2100 COMPUTER SYSTEM

PLANNING AND COORDINATION SECTION

R.B. Aronsen, R. Thieme, C.J. Watt, I.G. Hone
M.J. Robertson (part of year)

The Section of four professional officers was fully staffed throughout the year. On 8 March Mr Watt proceeded on leave without pay for an extended period and was temporarily replaced in the section by Mr Robertson.

The Bureau program for 1976-78 was prepared and distributed in March 1976; notification of activities was passed to State Mines Departments and to the Mines Branch of Department of Northern Territory for concurrence. An abridged program was produced as Record 1976/23 in March and made available to the public through open file centres and the BMR symposium. The final draft of the marine forward program was submitted to the Minister in May. Supervisors' meetings for the 1977-79 program were conducted during the week ending 22 October.

During the year the Bureau's objectives were refined to align with current and foreseeable trends in the management of the nation's mineral resources.

Section members initiated, and were included in, committees formed to propose forward programs for palaeomagnetism and for mineral resource assessments. The results of the committees' work are given in BMR Records 1976/70 and 1976/74, respectively.

The project costing system was modified to accommodate the Library group and revised version of the project index was distributed. Computer printouts for details of costs and man-effort are now available for both calendar and financial years.

The section coordinated the training and employment of Colombo Plan Fellows and UNDP Fellows, and trainee technical officers. After discussions with staff members of Canberra Technical College, it was foreseen that the full-time Applied Science (Geology and Chemistry) certificate course will phase out at the end of 1976 in favour of a part-time course.

A period contract to cover the Bureau's helicopter (airlift) requirements for 1976 was implemented. Arrangements for the period contract for 1977 were begun in November 1976.

The Section co-ordinated arrangements for the move of elements of the Bureau to accommodation in Queanbeyan. Planning progressed towards a new centre elsewhere in Canberra for the whole of BMR; to this end the Section co-ordinated the preparation of the initial planning document required by NCDC

As a result of economic restrictions, a number of staff and finance reviews were undertaken in order to match program with available resources. The Section also twice prepared the forward staffing estimates for 1976-77.

In early September the Secretary of the Department of National Resources took action to establish a Review Committee to examine the role and operation of BMR; it is expected that the review will be completed by April 1977. Commencing October, R. Thieme was detached for special duties with that Committee.

Other activities undertaken by the Section included the drafting of the BMR response to the Administrative Review Committee ('Bland Committee') appointed by the Prime Minister on 21 December 75, the preparation of a draft inter-Governmental agreement with respect to the crustal movement project in Papua New Guinea, the preparation of a contribution to project SCORE and preparation of works and papers to submit to the BMR Review Committee.

The following table provides a break-down of BMR expenditure and manpower effort for the 1975/76 financial year.

TABLE 1.

BREAKDOWN OF BMR EXPENDITURE AND EFFORT FOR 1975/76

Expenditure in dollars and as a percentage of total BMR expenditure
Effort in man-years and as a percentage of total BMR effort

BRANCH/SECTION/GROUP	TOTAL EXPENDITURE		SALARIES		TOTAL MANPOWER *	
	$	%	$	%	Man-years	%
GEOLOGICAL BRANCH	3 585 000	31.4	2 536 200	33.3	213.1	38.0
Sedimentary Mapping	609 000	5.3	364 600	4.8	28.4	5.1
Photogeology	51 000	0.5	37 500	0.5	2.3	0.4
Palaeontology	312 000	2.7	277 000	3.6	23.4	4.2
Marine Geology	153 000	1.3	128 500	1.7	10.9	1.9
Metalliferous Mapping	649 000	5.7	397 500	5.2	30.1	5.4
Darwin Uranium	104 000	0.9	74 800	1.0	6.0	1.1
Petrology	126 000	1.1	104 000	1.4	7.1	1.3
Geochemistry	26 000	2.3	165 700	2.2	15.0	2.7
Geochronology	13 000	1.1	60 200	0.8	4.5	0.8
Geobiology	51 000	0.4	47 900	0.6	3.5	0.6
Engineering Geology	260 000	2.3	200 100	2.6	19.1	3.4
Drafting	469 000	4.1	417 600	5.5	40.9	7.3
Photographic	53 000	0.5	37 600	0.5	4.5	0.8
Map Compilation	64 000	0.6	64 200	0.8	3.9	0.7
Museum	33 000	0.3	27 900	0.4	2.4	0.4
Mineral Reports	40 000	0.4	40 300	0.5	4.3	0.8
Geol. Branch Undiff.	222 000	1.9	90 900	1.2	6.5	1.2
GEOPHYSICAL BRANCH	4 302 000	37.6	2 770 200	36.3	229.1	40.8
Metalliferous (Canberra)	244 000	2.1	206 800	2.7	16.3	2.9
Metalliferous (Darwin)	35 000	0.3	22 500	0.3	2.0	0.4
Airborne (Aircraft)	451 000	3.9	143 500	1.9	10.9	1.9
Airborne (Contracts & Reductions)	178 000	1.6	94 300	1.2	7.1	1.3
Observatories	557 000	4.9	358 000	4.7	29.0	5.2
Regional Gravity	121 000	1.1	79.100	1.0	6.1	1.1
Regional Structural	117 000	1.0	95 800	1.3	7.0	1.2
Gravity	86 000	0.8	37 800	0.5	3.2	0.6
Seismic	399 000	3.5	225 200	3.0	21.0	3.7
Marine	424 000	3.7	321 400	4.2	25.6	4.6
Geophysical Labs	901 000	7.9	528 800	6.9	45.1	8.0
Engineering Geophysics	154 000	1.3	119 900	1.6	10.0	1.8
Drafting	468 000	4.1	430 100	5.6	40.1	7.1
Geophys. Branch Undiff.	169 000	1.5	107 100	1.4	6.0	1.1
MINERAL RESOURCES BRANCH	852 000	7.5	626 000	8.2	50.5	9.0
Mining Engineering	35 000	0.3	33 300	0.4	1.8	0.3
Mineral Economics	245 000	2.1	208 500	2.7	15.0	2.7
Pet. Tech. Labs	88 000	0.8	78 700	1.0	5.2	0.9
Pet. Tech. Office	114 000	1.0	111 500	1.5	7.9	1.4
Drilling	365 000	3.2	194 500	2.6	20.5	3.7
Min. Res. Branch Undiff.	5 000	0.1	0	0	0	0
PETROLEUM EXPLORATION BRANCH	777 000	6.8	436 900	5.7	34.3	6.1
Basin Study Group	201 000	1.8	196 500	2.6	14.6	2.6
Core and Cuttings Lab.	31 000	0.3	31 300	0.4	4.3	0.8
Subsidy	150 000	1.3	149 600	2.0	10.8	1.9
Drafting (PEB)	37 000	0.3	36 600	0.5	3.6	0.6
PEB Undiff.	25 000	0.2	22 800	0.3	1.0	0.2
OPERATIONS BRANCH	1 463 000	12.8	1 043 600	13.7	28.7	5.1
Planning and Co-ordination	64 000	0.6	57 000	0.7	3.6	0.6
Information	82 000	0.7	77 300	1.0	5.6	1.0
Editing	126 000	1.1	106 600	1.4	6.7	1.2
ADP	311 000	2.7	136 400	1.8	11.8	2.1
Administration, Library, Publ.	845 000	7.4	644 600	8.5		
Operations Branch Undiff.	35 000	0.3	21 700	0.3	1.0	0.2
BMR Undifferentiated	768 000	6.7	207 100	2.7	5.0	0.9
TOTALS	11 429 000	100	7 621 100	100	560.8	100

* Manpower excludes Administration and Library personnel, and trainee technical officers and draftsmen; includes wages hands.

Derivation: Figures prepared from BMR Costing System for 1975/76

ADMINISTRATIVE SECTION

Staff

B.W. Williams
G.C. Scott
T. Devine
P. Johnson
M. Terefelco
L. Desmond
D. Crombie
D. McGlynn
A. Lee
P. Flanagan
C. Tomlinson
K. Styles
O. Domitrjak
L. Mackintosh
C. Casadei
A. Haines
E. Moreno
M. Murphy
A. Witherdin
D. Parkes
J. Oldfield
N. Hyett
N.J. Sheppard
V. Mraz
D. Stafford
P. Filby
S. Shippley
J. Richardson
S. Fulton
D. Shaw
E. Smith
I. Hillier
A. Eglite
B. Baker
J. Fry
P. Evans
R. Gajic
D. Leonard
M. Tyrrell
A. Walker
J. Kopras
J. de Zilva
S. Bilton
B. Marshall
A. Martin
H. Reilly
J. Magro
L. Walton
B. Thompson
C. Ryan
J. Gilmore
K. Moloney
P. Shore
W. Hessler
N. Foudoulis
A. Wong
E. Petrushevski
S. Hassan
S. Westerhuis
G. Mortimer
S. Styles
M. Tacon
B. Barrett
P. Black
J. Bayliss
W. Gunner
S. Stanford
R. Gibbs
S.R. Ross
P. Corrigan
D. Lamont
R. Ingram
J. Milliner
J. Keogh
S. Schaaf
J. Somerville
W. Coulson
A. Bright
J. Tait
M. Dawes
L. Woods
G. Lohse
N. Elgood
M. Harding
R. Nott
J. Rhodes
T. Scheld
S. Bresnan
A. Pasfield
B. O'Connor
M. Kwaczynski
A. Neilson
E. Perceval

Resignations and transfers of clerical staff, coupled with stringent staff ceilings, has resulted in six clerk vacancies, thirteen clerical assistant vacancies and three typist vacancies as at 31 October. A large proportion of the administrative staff were on higher duties during the year.

After an internal review of the Administrative Section, a new position of Clerk Class 7 (Assistant Administrative Officer) was created.

BMR staff changes for the period 1 October 1975 to 30 September 1976 were:

	Joined	Left	Difference
Professional	5	18	-13
Technical/Drafting	10	19	-9
Clerical	7	25	-18
	22	62	-40

Finance

Government decisions to further restrain expenditure placed an increased workload on the Finance Sub-section. Many meetings were held with senior staff to determine where cuts could be made to the draft estimates. Final estimates for the financial year 1976/77 and actual expenditure in 1975/76 are listed in Table 2.

A Register of Purchase Order Requests was started on 1 July. This will result in better control of BMR funds and will enable Branches and Sections to know more accurately their cash and committment position.

Works program

In accordance with a Treasure direction in June, the Department of Administrative Services has taken over control of the BMR building with respect to repairs and maintenance, major new works, and fittings.

A major cut-back in funds for works programs, however, has meant that there will be little or no minor works (e.g. partitioning), or general repairs and maintenance carried out within the building during 1976/77. Table 3 lists the funds provided for the four works program categories.

Tenders for construction of the Gnangara Observatory, WA, are almost finalised and construction should begin in January 1977. Tenders for the construction of the Kowen Observatory, ACT are expected to be finalised in April 1977 and construction is planned to begin in June 1977. Modifications to rooms 51 and 55 (Basement) are expected to start in May 1977.

TABLE 2

EXPENDITURE FOR 1975/76 AND FINAL ESTIMATES FOR 1976/77

Division 432		Estimate 1976/77	Expenditure 1975/76
		$	$
1.	Salaries and Payments in the nature of salary		
01.	Salaries and allowances	7,740,000	7,409,350
02.	Overtime	128,000	137,755
		7,868,000	7,547,104
2.	Administrative Expenses		
01.	Travelling and subsistence	423,500	371,863
02.	Office requisites and equipment, stationery and printing	157,000	78,515
03.	Postage, telegrams and telephone services	232,000	228,426
04.	Office services	40,000	34,116
05.	Printing and distribution of maps and publications	320,000	336,350
06.	Motor vehicles - Hire and maintenance	660,000	647,132
07.	Aircraft - Maintenance and running expenses	297,000	274,349
08.	General stores	430,000	427,529
09.	Contract investigations	694,000	839,633
10.	Freight and cartage	75,000	73,621
11.	Minor field operating costs	120,000	69,539
12.	Repairs and maintenance of plant and equipment	65,000	54,478
13.	Computer services	475,000	439,632
14.	Incidental and other expenditure	55,500	57,519
		4,044,000	3,932,702
3.	Other Services		
01.	Riverview Observatory - Grant	6,000	6,000
	Search for Oil - Subsidy	-	186,235
		6,000	192,235
	Total Division 432	11,918,000	11,672,041
Division 883			
1.	Plant and Equipment		
01.	Bureau of Mineral Resources	555,000	576,657
	Total Division 883	555,000	576,657
	Grand Total - BMR	12,473,000	12,248,698

The Department of Construction is preparing design lists for a major rebuilding of all fume cupboards in the Building, but the work is not programmed until late 1977. The extension to the Cores and Cuttings Laboratory at Fyshwick and heating of the storage area have reached 'design list' status.

TABLE 3

WORKS PROGRAMS 1976/77

	$	
Repairs & maintenance	26 000	(Dept. Admin. Services $110 500)
Major new works	211 000	(" " " $ 5 500)
Minor new works	76 000	
Furniture & fittings	22 900	

Publications

The following publications were released during the period 1 October 1975 to 30 September 1976:

Bulletins

151	Palynology of the Cenomanian rocks of Bathurst I., N.T. (Burger & Norvick)	($13.25)
155/PNG 9	Geology of the Kubor Anticline, central highlands of Papua New Guinea	($13.75)
156B	Correlation chart for the Permian System of Australia (Dickins)	($13.00)
158	Conodont biostratigraphy of the Upper Devonian reef complexes of the Canning Basin, W.A. (Druce)	($26.75)
159	Cymbric Vale fauna of New South Wales and Early Cambrian biostratigraphy (Opik)	($ 4.75)
160	Palynological Papers 1. Some Early Cretaceous microfossils from Queensland (Burger) 2. Palynological observations in the Officer Basin W.A. (Kemp)	($ 5.00)
165/PNG 11	Geology of the southeast Papuan mainland (Smith, Davies, & Belford)	($ 7.50)

Reports

162	Catalogue of isotopic age determination carried out on Australian rocks in 1966-70 (Bennett, Page & Bladon)	($ 6.50)
174	Geology of the Birrindudu and Tanami 1:250 000 Sheet areas, N.T. (Blake, Hodgson, & Smith)	($ 8.25)
175	Galilee Basin seismic and gravity survey Qld. (Moss, Harrison, & Anfiloff)	($ 8.25)
179/PNG 9	Marine geophysical survey of the Bismarck Sea and Gulf of Papua, 1970. A structural analysis of the Gulf of Papua and northwest Coral Sea region (Mutter)	($ 3.50)
182	Tottenham detailed aeromagnetic survey NSW, 1971 (Rees & Taylor)	($11.50)
190	Geophysical Branch summary of activities 1974	($ 5.00)
194	Geological Branch summary of activities 1975	($ 5.75)

Australian Mineral Industry

1973 Review (10.00)
Preprint Chapter - Petroleum ($1)

1974 Review ($13.00)
Preprint Chapters - Copper ($1.00)
Lead ($1.00)
Nickel ($1.00)
Black Coal ($1.00)
Tin ($1.00)
Petroleum ($1.00)
General Review ($1.00)

Quarterly, Vol. 27 No. 4 ($1.50)
Vol. 28 No. 1 "
Vol. 28 No. 2 "
Vol. 18 No. 3 "

Geological maps and explanatory notes

Fog Bay, N.T.	($3.00)
Birrindudu, N.T.	"
Cobourg Peninsula/Melville I., N.T.	"
Bathurst I./Melville I., N.T.	($6.00)
Tanami, N.T.	($3.00)
Neale, W.A.	"
Madley, W.A.	"
Browne, W.A.	"
Talasea/Gasmata, PNG	"
Cape Raoult/Arawe, PNG	"
Markham, PNG	"

Preliminary geological maps ($1.00 each)

Goodspeed Nunatacks, Antarctica	1:250 000	Manus I., PNG	1:100 000
Mawson Escarpment North, Antarct.	1:250 000	Forsayth, Qld	1:100 000
Mawson Escarpment South, Antarct.	1:250 000	Crossland, W.A.	1:250 000
Mount Peake, N.T.	1:250 000	Mt Menzies, Antarct.	1:250 000
Cornish, WA	1:250 000	Mt Twigg, ANT	1:250 000
Hermansburg, N.T.	1:100 000	Admiralty Is., PNG	1:250 000
Bogia, PNG	1:250 000	Haddon Corner, Qld	1:250 000
Junction Bay, N.T.	1:250 000	Gosses Bluff, N.T.	1: 50 000
Tea Tree, N.T.	1:100 000	Sthn. Burke River Structural Belt, Qld.	1:100 000
Reynolds Range, N.T.	1:100 000		
Goomadeer, N.T.	1:100 000	Wellington Range, N.T.	1:100 000
		Mt Bannerman, W.A.	

Geophysical Maps

1:250 000 total magnetic intensity maps ($1.00 each)

Bencubbin, W.A.	Pinjarra, W.A.
Moora, W.A.	Kellerberrin, W.A.
Ninghan, W.A.	Wangaratta, Vic.
Perenjori, W.A.	Bendigo, Vic.
Corrigin, W.A.	Tallangatta, Vic.
Perth, W.A.	

Magnetic map of Australia 1:2 500 000 (in four sheets @ $2 per sheet)

Gravity map of Australia 1:5 000 000 ($2.00)

Gravity maps 1:5 000 000 ($1.00)

Wooramel	Edel
Ajana	Yaringa
Shark Bay	Kennedy Range

Miscellaneous

1:2 500 000 geology of Australia (in four sheets @ $3.00 per sheet)

1:2 500 000 geology of the Northern Territory ($3.00)

1:2 500 000 Cainozoic geology of the Northern Territory ($3.00)

1:2 500 000 geology of Papua New Guinea ($3.00)

BMR Journal of Australian Geology & Geophysics Vol. 1, Nos. 1, 2, and 3 ($3.00 each).

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	A. Mond, Promovany Geol.
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	J. Knutson, B.A.(Hons), Ph.D.
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	K.A. Long, B.Sc., Dip. Inf. Proc.
	J.F. Marshall, B.Sc.(Hons)
	J.E. Mitchell, B.Sc.(Hons)
	P.A. Scott, B.Sc.(Hons)
	S. Shafik, B.Sc., M.Sc.
	P.G. Stuart-Smith, B.Sc.(Hons)
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CHIEF DRAFTSMAN GRADE 1	R. Inglis
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R.A. Almond	Geophysicist Class 3
G.K. Anderson	Geologist Class 1
R.J.S. Cooke	Geophysicist Class 3
H.L. Davies	Geologist Class 3
V. Dent	Geophysicist Class 2
B.H. Dolan	Geophysicist Class 2
L.J. Pigram	Geologist Class 1
P.M.T. Ryan	Technical Officer Class 1
D.A. Wallace	Geologist Class 1

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D. Coutts	Senior Technical Officer (part-time)
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P.A. Smith, B.Sc.	Geologist Class 2

Officers on Study Leave at 31 October 1976

H. Allison	Sydney Technical College
D.J. Ellis	Australian National University, Canberra ACT
A.L. Jacques	Australian National University, Canberra A.C.T.
L.F. Macias	Imperial College, London U.K.
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L.A. Wyborn	Australian National University, Canberra ACT
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G.C. Young	University of London, U.K.