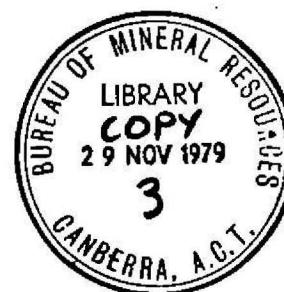




DEPARTMENT OF
NATIONAL RESOURCES
NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

RECORD 1979/71

OPERATIONS BRANCH



SUMMARY OF ACTIVITIES

1979

AND STAFF LIST

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RECORD 1979/71

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CONTENTS

	<u>Page</u>
PUBLICATION AND INFORMATION SECTION	1
Publication Subsection	1
Information Subsection	2
LIBRARY	4
ADP APPLICATIONS SECTION	7
PLANNING AND CO-ORDINATION SECTION	10
CARTOGRAPHY SECTION	11
ADMINISTRATIVE SECTION	14
 APPENDIX 1: Publications issued in period 1/10/78 to 30/9/79	 19
APPENDIX 2: Records issued on open file in period 1/10/78 to 30/9/79	 22
APPENDIX 3: Data issued through Government Printer copy service in period 1/10/78 to 30/9/79	 25
 LIST OF BMR STAFF (as at 31 October 1979)	

PUBLICATION AND INFORMATION SECTION

Head of Section: A. Renwick

Two major innovations in the management of the publication program were introduced during the year. The first was the establishment of the Publication Policy Committee comprising all Branch Heads and the Head of this Section. It has met quarterly, and has had one additional meeting to discuss a matter referred to it by the Director.

The second was the constitution of the Publications Co-ordinating Committee comprising the Head of this Section, both Principal Editors, the Principal Information Officer, the Chief Cartographer (Production), the Senior Map Editor, and the OIC Publications Production Group. This Committee has met fortnightly to review progress of publications and to co-ordinate the movement of manuscripts and maps through the stages of editing and production.

Continuing activities which involve the whole Section are the BMR Symposium, which this year was held early in May, co-ordination of the BMR Yearbook, BMR 78, which was published in time for distribution at the Symposium, and the updating of BMR's project material brochures.

Publications Subsection

Principal Editors: W.H. Oldham, J.F. Truswell

The Subsection has continued to operate with a reduced staff, but the year has seen a steady flow in editing and publication of the in-house products. Some Bulletins had fallen behind editing schedule in 1978, but the backlog was eliminated; five Bulletins were released during the year, and nine are in press at the time of writing. Teething problems with the Micrographics Bureau of the Government Printing Office over the conversion of the Report Series to microfiche were resolved during 1979. An innovation in the Report Series was Report 215 (MF 100) 'Preliminary Report on the Cadoux Earthquake, Western Australia, 2 June 1979', in which the microfiche was accompanied by hard copy photographs.

Further changes were made to the appearance of the Australian Mineral Industry Annual Review. Two special numbers of the BMR Journal of Australian Geology & Geophysics were produced for the IUGG Assembly, held in Canberra in December 1979.

The format for the Commentaries to accompany the semi-detailed 1:100 000 maps was finalised; so too was the cover, and lay-out for commentaries, for the forthcoming BMR Earth Science Atlas of Australia. The maps and commentaries will be released as they become available: the first batch went on display, and were available for sale, at the IUGG Assembly.

The Subsection played a major role in the panel discussion at the 8th BMR Symposium entitled 'Taking publications into the Eighties', and also mounted a display on BMR's publications.

A member of the Section convened the group that considered word processing in BMR. In the follow-up to this two WORDPLEX-2 machines were installed.

Information Subsection

Principal Information Officer: E.P. Shelley

General services

A large part of the Subsection's activities was directed towards the continuous flow of enquiries from Government, industry, and the public. The demand from schools and students for project material increased markedly from July onwards. This was due to the listing of BMR as a source of material in a book which was widely distributed throughout Australia. Requests reached 80 per day in mid September and, while they have tapered off, they are still at a high level.

The Subsection co-ordinated BMR contributions to various publications including the AAEC Annual Report, Newsletter of the NSW Committee for the Co-ordination of Government Geological Programs, the Department's Annual Report, and the Arid Zone Newsletter. The Subsection also co-ordinated answers to Parliamentary questions, Ministerial briefs, and BMR contributions to several Departmental submissions to Parliamentary committees. E.P. Shelley attended a number of departmental meetings on 'Freedom of Information' legislation.

Briefs were prepared for the Department of Foreign Affairs for the 35th meeting of ESCAP and the 6th session of the ECOSOC Committee on Natural Resources. Mrs Young and E.P. Shelley represented BMR at several interdepartmental meetings on Australian involvement in the UN Conference on Science and Technology for Development.

Information Systems

Following discussions with the Stratigraphic Index group and the ADP Applications Section, the DADEX computer database, originally designed for BMR publications and Records, was upgraded to cater for the Stratigraphic Index and other bibliographic uses. It was renamed GEODX (BMR Geoscience Index). All data in DADEX was transferred to the new format.

Considerable effort was put into verifying publication and Record entries in GEODX. At the end of October, author/title details of all Bulletins, Reports, and Records from 1942 to 1972, were in the database, and a start was being made on subject/location indexing.

BMR continued its support of AESIS (Australian Earth Sciences Information System). \$5000 was contributed towards AESIS computing costs in 1978/79 and a further \$5000 has been provided for 1979/80. Discussions have been initiated with the Australian Mineral Foundation on developing a co-ordinated approach to indexing for AESIS and GEODX. E.P. Shelley represented BMR at the AESIS Advisory Committee meeting in Sydney in November.

Developments relevant to national science and technology information systems were kept under review during the year.

Publications

A revised Record author list was issued, and Open File Circular No. 15 is currently in preparation. When it is issued, a new consolidated list of all Records on Open File will be prepared.

Edition 3 of the two brochures 'The geological and geophysical activities of BMR in Australia and Antarctica' was issued in April.

The 10th issue and one supplement of the list of coming events in the earth sciences was compiled and distributed within BMR and to some other organisations and individuals.

Internal information services

The Subsection continued to provide a watching brief on UN activities in the earth sciences and mineral and energy resources relevant to BMR, and briefed officers and circulated material as appropriate. Hansard was scanned for items of interest to BMR and these were circulated to relevant officers.

Advice was provided to various BMR groups on information storage and retrieval, and applications of microfilm. Further discussions were held on the long-standing need to microfilm all PSSA reports and a project to commence this was included in BMR's 1980 program.

Symposium and lectures

The 8th BMR Symposium was held in Canberra on 1-2 May. There were 124 registrations by geoscientists from industry, tertiary institutions, and Commonwealth and State organisations. Seventeen papers were presented by BMR scientists and a panel discussion was held on BMR publications. The Harold Raggatt Award for the best presentation was awarded to Mr. John Bain for his paper on the Etheridge Goldfield.

The Subsection organised the Tuesday morning lecture series which was held at BMR from January to April and November to December.

Public relations and publicity

Several school groups visited BMR during the year. Many of these were organised in co-operation with museum staff. The Subsection is grateful for the co-operation and support of staff

in the work areas that were visited.

Careers information in the earth sciences, cartography, and mapping was provided at 'Careers 79' organised by the Lions Club at CCAE in June.

In the 12-month period October 1978 to September 1979, 40 news releases were made on various BMR activities, publications, and availability of data.

Displays and exhibitions

A display of earth science teaching materials available from BMR was provided for a weekend conference of the ACT Science Teachers' Association in March. Some display material on Antarctica was lent to the Academy of Science for an exhibit also in March.

The gravity display in the foyer of the BMR Building, was replaced in May with one on Australia's mineral and energy resources and one depicting the range of BMR publications. These displays were replaced in September with one featuring BMR's role in map making. This was part of BMR's contribution to National Map Week.

Following discussions with Dr. M. Gore of ANU, BMR has undertaken to supply a fluorescent mineral display unit to the 'Questacon' - science education centre - to be established in Canberra in 1980.

LIBRARY

Librarian-in-charge: M.A. Thompson

The major achievement during the year was the further development of the computerised loan system, and the use of that database for other library activities.

The system was commenced in October 1978 and, while much progress has been made in its development, it has not been as free of problems as we would have hoped. Development of the computer operating system, shutdowns for maintenance and system 'crashes' resulted in the computer not being available for periods of time ranging from a few hours to several days. This caused considerable backlogs in data input and database interrogation.

The database was restructured in September in order to make more efficient use of disc storage space. This exercise also resulted in delays in use of the database, and also required some of the programs to be rewritten.

On the positive side, we are now producing recall notices automatically, and consequently the loan records are more up-to-date than at any time in the past. An additional benefit is that author/title information is entered only once to the database thus avoiding the mis-spellings and consequent mis-filings inherent in

manual systems. A program is also being developed to produce the regular accessions list from the database.

In June, the teletype terminal was replaced with a VDU, thus avoiding the noise of the former, which was a source of complaint by some users, and unnecessary use of computer paper.

The computerisation project has also resulted in changes to duties and re-allocation of work loads of all library staff.

Computer-based reference searches

Use was made of the AESIS database, through CSIRONET, for several reference searches during the year. A number of computer-based searches were also arranged through ANSTEL at the National Library, and through CSIRO's Retrospective Search Service.

The searches made by external organisations tended to retrieve too many items and thus commit BMR to unnecessary expense. A proposal to conduct our own searches on overseas databases was therefore investigated. We have now registered with Lockheed Information Systems and SDC Search Service, both in California. These services will be accessed through CSIRONET, MIDAS (Overseas Telecommunications Commission satellite link) and TYMNET.

Duplicate lists

Because of time taken up in the computerisation project only one list of duplicate serials and one of duplicate monographs were compiled during the year. They have not yet been distributed.

Visiting Librarian

Considerable assistance was given to the Northern Territory Department of Mines and Energy in the establishment of their library. Copies of our cards, forms, and user brochures were sent to Darwin, and in September, Ms Frieda Evans spent a week at BMR studying our working procedures.

Bibliographies

The following bibliographies were issued during the year -

No. 7. Government policy and mineral exploration; compiled by R. Lorenz, B. Elliott and N. Knight.

No. 8. A basic reading list in palaeontology.

No. 9. The occurrence of oil shale deposits in Australia; compiled by R. Lorenz and D. Gibson. (This bibliography was produced from the OSHAL computer data base. It can be updated and re-issued at regular intervals).

A bibliography on 'Uranium in Australia to 1975' has been compiled, but has not yet been issued.

It is proposed to issue all existing and future bibliographies as Open File microfiche Records.

Seminars and courses

Library staff attended the following seminars and courses during the year:

- 5 March - The Ordering Officer, Mrs J. Tait, and the Librarian-in-Charge attended a Seminar on Library Purchasing held at CSIRO, Limestone Avenue. It was organised by the Special Libraries' Section of the ACT Branch of the LAA.
- 5-9 March - The Serials Librarian, Mr. L. Leitch, attended an Introduction to ADP course at the Training Centre, Tudor House, Yarralumla.
- 10 April - The Inter-library Reference Officer, Mrs I. Toth, attended a meeting of Inter-library Loan Officers at the National Library of Australia.
- 11 April - The Ordering Officer attended a Purchasing Procedures Meeting conducted at BMR by Mr. H. Lauchland, Superintendent of Supply.
- 30 April - The Reference Librarian, Mrs R. Lorenz, went to a Data Base Management Meeting held at the National Library of Australia and sponsored by the LAA.
- 1 June - The Librarian-in-Charge attended a Workshop on the Second Edition of the Anglo-American Cataloguing Rules (AACR 2) organised by the LAA and the Department of Librarianship of the Royal Melbourne Institute of Technology.
- 3 July - The Librarian-in-Charge attended an after-work seminar arranged by the LAA, ACT Branch, Special Libraries Section. The topic was the National Library Technicians Seminar held at Sydney in May 1979.
- 26-30 August - The Reference Librarian and the Librarian-in-Charge attended the 20th Biennial Conference of the Library Association of Australia (LAA) held in Canberra.
- 31 August - The Reference Librarian attended the Post-Conference Seminar on Australian Government Publications.

Statistics

A statistical summary of library activities for the period 1/11/78 to 31/10/79 is in the following table. The figures in parentheses are for the previous 12-month period.

Loans (internal):	9842 (10 348)
Reference Searches:	
total	375 (309)

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for BMR staff	201	(184)	
for others	174	(125)	
Items recalled:	7512	(4655)	
Serials circulation:	8100	(8079)	
Inter-library loans:			
Requested from BMR	3128	(2577)	A rise of 21.4% on previous year's figures
Requested by BMR	440	(481)	A fall of 8.5% on 1978, probably due to lower staff numbers
Accessioning:			
New Serials added	201	(253)	
Books	342	(429)	From December 1978 the price limit on books to be accessioned was raised from \$6.00 to \$10.00.
Binding:	235	(301)	
Cataloguing (new and revised):			
Books, pamphlets maps and company reports	1040	(921)	
Serials	259	(292)	
Visitors to the Library	475	(315)	

ADP APPLICATIONS SECTION

Head of Section: A.J. Barlow

General

The section provided the same on-going services as in previous years. These functions included on- and off-line data preparation, data digitising, CSIRO node operation, operation of the Hewlett Packard computer system and provision of consultant services to user groups.

CSIRO Computing

Most of the Bureau's computing continued to be done using the CSIRO CYBER 76 system. Availability of the system was mostly satisfactory. Restructuring of the priority system on the

8.

CYBER and the shortage of funds has caused production work to be run at the lowest priority. This resulted in long delays of up to 48 hours before results were obtained.

The newly formed User Assistance Group at CSIRO provided constructive assistance in reading magnetic tapes created at other installations and in providing advance warning of changes to the system allowing the ADP Section to evaluate their impact before general use.

Finance

Shortage of computing funds continued to be a problem, forcing use of low priority. Computing expenditure for the year 1978/79 was \$555,000 including \$160,000 for consumables, repairs and maintenance. Expenditure for 1979/80 is expected to be \$580,000.

Information storage and retrieval

There are now 18 data bases in operation on the Hewlett Packard computer system using the IMAGE software package. All data base work has been taken off the CYBER. The ultimate size of some of the larger data bases is going to place a heavy load on the resources of the H-P system. Shortage of disc space will be partly alleviated when the full capacity of the 120 megabyte disc becomes available late in 1979.

Automated cartography

Little progress has occurred on this project owing to the pressure of other work; some advice is being given to user groups. The Calcomp 936 drum plotter has been connected on-line to the Hewlett Packard system and software is being developed to free one of the off-line plotter controllers and increase the productivity of the plotters. A program was also developed to display plots produced by the CYBER on the PRINCETON graphics terminal.

ANU joint projects

The mass spectrometer system was upgraded with additional computer memory and installation of RTE III operating system software. This enabled all the data acquisition programs to be rewritten as relatively simple FORTRAN programs greatly simplifying maintenance and future program enhancement. ANU have appointed a research assistant to help with the development of the system. Consequently ADP involvement in this system should reduce next year.

Little progress was made with the ion microprobe software in 1979 due to technical problems with the machine. These have now been overcome to the point where the mass analyser is useable and further program development is needed immediately.

The first stage of a data acquisition system for the cryogenic magnetometer at the Black Mount palaeomagnetic laboratory

was implemented using one of BMR's obsolete H-P 2116 computers. This system will later be upgraded to include several other magnetometers as new hardware becomes available. The data will be processed at BMR and stored as an IMAGE data base. Development of the data processing will be completed by the end of 1979.

Computer review

Work continued on determining the feasibility of BMR acquiring a larger in-house computer system to handle a significant proportion of the work now done on the CYBER. Assessment of BMR's short term computing requirements and assessment of the cost/performance of suitable systems have been initiated. A report and recommendations should be available in late 1979.

Assistance to other Branches

Assistance was provided to other branches in the areas of program design and development, and program conversion. The Mineral Resources Branch was given particular assistance and some large computer-aided design packages were converted to the CYBER for the Engineering Services Section.

Training

Section staff assisted the Department's Training Section in providing a number of introductory ADP and FORTRAN courses. This work is increasing and is expected to triple next year.

Hewlett Packard computer system

Use of the Hewlett Packard 2100A-2108A computer facility continued to expand particularly in the areas of data base and scientific data processing.

Memory size of the 2108A was further increased to 352K bytes. An H-P 7925 120 megabyte disc was added to the system but only 50 megabytes was immediately useable. The full capacity will not be available until upgraded H-P software is available in late 1979. The BMR terminal system (TEROS) was reworked to take advantage of the new H-P RTE-IV operating system. All terminals were transferred to the 2108A computer leaving the near-obsolete 2100A dedicated to outspooling and system backup tasks. Loading on the 2108 is high; there is 40-50% CPU utilisation over the 9-hour working day. This computer is now effectively saturated.

No new laboratory data acquisition sub-systems were developed in 1979. Future projects in this area include the XRF unit and the scanning electron microscope.

A new H-P 2117F computer and I/O extender were delivered in October. This machine will replace the obsolete 2100. It is 2 to 10 times faster and has 512K bytes of memory; it will substantially increase the processing capability of the H-P system. Significant enhancements to the operating system software will be available when RTE-IVB is installed in late 1979.

The main improvements will be an enhanced IMAGE data base package, double word addressing for disc files, full support of the 120 megabyte disc, time slicing, user capability levels, accounting data and private user disc packs. The only BMR enhancement to the RTE-IV system planned at this stage is the development of a batch processing facility. This will increase the utilisation of the system by allowing overnight processing of a single job stream.

PLANNING AND CO-ORDINATION SECTION

Head of Section: K.M. Kennedy

Program

A report to the Prime Minister by the Australian Science and Technology Council (ASTEC) on the Bureau of Mineral Resources (October 1978), and a statement by the Prime Minister (22 June 1979) implied a redirection of the Bureau's scientific program. The Prime Minister stated that 'The Bureau is to be made into a geoscientific research organisation with a substantial capacity to undertake the more sophisticated scientific studies required to support the fullest development of our resources. In this regard it will have an enhanced role in relation to the exploration for and assessment of Australia energy resources'. This new role was confirmed on 25 October 1979 when the Minister for National Development visited BMR to announce the Cabinet's decision that BMR should be established as a geoscientific research organisation with the Department of National Development.

In anticipation of 'an enhanced role in relation to the exploration for and assessment of Australian energy resources', four ad hoc task groups were set up to consider and recommend programs for petroleum, coal, oil shale, and uranium. Members of the Planning and Co-ordination Section were conveners of these task groups and the resulting recommendations were important considerations at the Supervisors' Program Meetings.

The increased emphasis on energy minerals was the main new programming consideration this year at the Supervisors' Program Meetings held on 14-16 and 25 October.

The Section was involved throughout the year with meetings associated with BMR program, and particularly with the Marine and Oil Shale Committees.

Program costing

Several projects were costed throughout the year but with the promotion of C. Watt out of the Section, proper maintenance of the costing system which has been in operation for several years, has not been possible. There was a growing awareness of the need for estimating manpower and financial costs as an important input to program decisions. At the time of writing this report an effort is being made to have

realistic cost estimates available for the Director's program meeting late in November.

Index to the Section's information

A computer-based Planning and Review Information System (PARIS) which was begun in 1978 proved very useful to the Section and other BMR officers in retrieving information documents on matters related to BMR program, costs, objectives, role, and related information.

ARPAC and AMSTAC

K.M. Kennedy represented the Director at a number of meetings of the Antarctic Research Program Advisory Committee (ARPAC) and the Australian Marine Science and Technology Advisory Committee (AMSTAC). Mr. L.W. Williams is an appointed observer to these Committees.

General

Assistance and advice were given to the Director and Assistant Director (Operations) on financial and manpower resources allocated to or required for projects. Papers were prepared on the current program. Visits of a number of scientists from overseas were co-ordinated.

CARTOGRAPHY SECTION

Chief Cartographer (Production): P.A. Boekenstein
Chief Cartographer (Resources): M.E. Nancarrow

Management and staffing

Management of the section continued to be run on 'matrix' lines with the Mapping Sub-section located at Canberra and the Publication Drafting Sub-section at Queanbeyan. Project management continued to work efficiently and greater effort was made to apply this system in the Mapping Sub-section.

Several publication drafting projects were put out to contract drafting.

At 31 October 1979, the staff of the section consisted of 73 Draftsmen, 1 Graphic Designer, 1 Technical Officer, 11 Drafting Assistants, 2 Photographers, 1 Assistant (Printing) and 1 Clerical Assistant.

Three draftsmen accompanied parties on field surveys. I. O'Donnell, Pine Creek (geology); D. Walton, Illogwa Creek (geology); A. Retter, Lachlan Geosyncline (geophysics).

M. Fetherston visited the two geological field parties and the BMR Darwin Office on a field supervisory visit from

9 to 26 August 1979. He also inspected several newly-completed field drafting caravans at the Department of Transport, Sydney.

F. Simonis visited Qasco Pty Ltd. at Brisbane from 30 January to 2 February 1979 to check the progress and accuracy of the McArthur Basin 1978 flight path recovery contract.

M. Nancarrow attended a meeting of the PSB Drafting Standards Committee on 16 October 1979 at Melbourne.

L. Kerec represented the section at two meetings of the visual aids working group, at Melbourne and Sydney.

R. Swoboda checked corrections and supervised the printing of eight BMR Earth Science Atlas maps at Mercury-Walch Pty Ltd., Hobart from 8 to 24 October 1979.

Production (November 1978 to October 1979)

1. <u>Geological maps</u>	<u>1:100 000</u>	<u>1:250 000</u>	<u>Other scales</u>
Photoscale compilation in progress	7	1	-
Photoscale compilation completed	4	-	-
Preliminary Edition:			
Compilation by BMR, in progress	9	3	2
Compilation by BMR, completed (ready for printing)	4	-	12
Printed	10	11	3
1st or 2nd Edition:			
Fair drawing in progress, BMR:	-	-	1
contract*:	2	2	3
Fair drawing completed, BMR:	-	-	11
contract*:	4	-	2
Printing in progress**	2	-	9
Printing completed**	1	13	5

Notes:

- * Contract drafting stages: Specifications prepared - 7 maps; contractor recommended - 8 maps; first proof checked - 15 maps; 14

second proof checked - 15 maps.

** Printing stages: specifications prepared - 21 maps; printing contracts recommended - 21 maps; colour designs and colour guides - 30 maps; screen masters and dyeproofs checked - 23 maps; machine proofs checked - 20 maps; printed maps checked - 21 maps..

The above statistics include:

(a) five 1:10 million maps for BMR Earth Science Atlas

(b) One 1:20 million map for BMR Earth Science Atlas

2. <u>Geophysical Maps</u>	<u>1:250 000</u>	<u>1:500 000</u>	<u>Other scales</u>
Pre-survey compilation, in progress	7	-	-
Pre-survey compilation, completed	6	-	-
Flight path recovery, in progress	3	-	-
Flight path recovery, completed	9	-	-
Preliminary releases: magnetic and radiometric	151	-	25
Pine Creek Geosyncline: magnetic and radiometric (colour)	-	2	-
Pine Creek Geosyncline: Bouguer anomalies	-	1	-
Gravity Series maps, in progress	9	-	-
Marine Surveys (computer drawn) completed:			
Track maps	-	-	55
Water depth profiles			55
Free air anomaly profiles			55
Residual total magnetic intensity profiles	-	-	55
Stream Sediment Geochemical Series (computer drawn), completed			11
3. <u>Text Figures, diagrams etc. completed</u>			
BMR Journal			179 15
BMR Journal (contract drafting)			53

Bulletins	270
Reports	87
BMR Earth Science Atlas commentaries	21
Explanatory Notes.	31
Records and miscellaneous (includes AMI)	1145
External publications	360
Transparent slides for lectures etc.	715

ADMINISTRATIVE SECTION

Administrative Officer: B.M. Williams

Staff

There was a slight increase in staff numbers over the year. This was in the lower classifications. In general, the Section operated with a continuous employment level of the order of 20 below establishment. Taking all clerical positions throughout BMR the employment level is around 30 below establishment. As a result, administrative support has been below the level of earlier years and on occasions has created difficulties in achieving results within deadlines. Another factor which has caused problems on a continuing basis is the lack of relief staff when senior staff go on leave.

Finance

A new method to control overtime and travel funds was introduced during the financial year 1978-79.

The level of commitment funds and cash for 1978-79 was, in real terms, less than those provided in 1977-78. Although financial management difficulties were experienced, particularly in the contracts, and plant and equipment items, the overall result was a shortfall of 1.5% in the total BMR expenditure during 1978-79.

The cash appropriation for 1979-80 is in excess of 1978-79 expenditure; however, in real terms this represents an actual reduction in funds.

The carry-forward from 1978-79 of unpaid commitments was reduced from the 1977-78 level and it is expected that a further reduction can be achieved at 30 June 1980.

Additional estimates were sought and obtained in 1978-79 for salaries and allowances (\$125 000), travelling and subsistence (\$18 000), BMR aircraft (\$26 000) and computer services (\$12 000). No funds were sought from the Advance to the Minister for Finance during 1978-79. Final estimates for 1979-80 and actual expenditure for 1978-79 are listed in Table 1.

Works program

The program for 1979-80 is shown in Table 2.

A new Palaeontological Rock Store was under consideration for construction in 1979-80; however, this has been deferred and the program is now as follows:

- (a) acquisition of site in Fyshwick 1979;
- (b) building to be constructed during 1980-81;
- (c) compactus units to be supplied and installed in 1980-81 and 1981-1982.

Work was authorised in September 1979 to upgrade the security of Tarradice Street, Darwin, Store including provision of three security bays for use by field parties.

It is not possible to meet demands for new furniture from the approved program. Some demands have been outstanding for 2 years.

The program for the further development of the Cores and Cuttings Laboratory at Fyshwick is as follows:

- (a) complete supply and fitting of compactus units to existing building during 1980-81;
- (b) provide next extension to building during 1982-83;
- (c) provide for supply and fitting of compactus units for the next extension in 1982-83.

Many areas of the BMR Building have required new floor tiles for some years. Action commenced on this problem during the year and should be finalised by the end of 1979.

General

The Registry was transferred back to BMR in August 1979. Agreement on staff numbers is yet to be finalised.

Action was taken to reduce the vehicle fleet by 27 by de-hiring them without replacement at the end of the 1978 field season. Following this action a full review of all remaining vehicles, both on hire and owned by BMR, was completed and a record established for each vehicle.

A stocktake of furniture, office machines, and publications was conducted during the year; reconciliations were not finalised at the time of this report.

The two Wang Word Processors were replaced with two new Sigma Data Wordplex units at a cost of \$28 000. An additional portable Nashua 220 Copier was purchased to supplement the existing copier.

A review of existing specifications for field stores was undertaken during the year.

Aboriginal Land Ordinance 1978 was issued by the NT Government. As a result, all BMR field staff were required to obtain permits signed by the Chief Minister. Ninety permits were sought and obtained.

Shortage of petrol following industrial trouble at a refinery in Sydney and 'truckies' blockades around NSW resulted in problems in maintaining current field activities and moving field parties in to and out of Canberra.

The Department of Administrative Services was requested to investigate and take action on the continuous burning-out of light bulbs in passage ways and stairwells, both of which are considered a hazard to officers' safety.

Following the resignation of an assistant at Mundaring who had occupied a BMR cottage, arrangements were made through the Department of Administrative Services in Perth to let the cottage to an officer of Telecom. This in turn provided on-the-spot security, cleaning, and gardening services for Mundaring Observatory at a substantial saving in costs.

The Administrative Section provided assistance throughout the year in the areas of office services, finance, staff and personnel, publications processing vehicles, typing services, registry, overseas duty and general administrative support.

Sales of BMR publications in Canberra was in excess of \$80 000.

TABLE 1Expenditure for 1978-79 and Final Estimates for 1979-80

Item	Description	Final Estimate 1979-80	Actual Expenditure 1978-79
432-1-01	Salaries and allowances	8 760 500	8 383 301
02	Overtime	149 500	141 032
		<u>8 910 000</u>	<u>8 524 333</u>
432-2-01	Travelling and subsistence	453 000	426 696
02	Office requisites and equipment, stationery and printing	193 000	122 279
03	Postage, telegrams and telephone services	229 000	211 742
04	Office services	38 000	32 875
05	Printing and distribution of maps and publications	400 000	389 152
06	Motor vehicles - hire and maintenance	605 000	590 472
07	Aircraft - maintenance and running expenses	300 000	287 985
08	General stores	508 000	493 706
09	Contract services	625 000	595 022
10	Freight and cartage	54 000	55 864
11	Repairs and maintenance of plant and equipment	73 000	68 459
12	Computer services	580 000	571 502
13	Incidental and other expenditure	72 000	63 592
		<u>4 130 000</u>	<u>3 909 246</u>
	Total Division 432	<u>13 040 000</u>	<u>12 433 579</u>
833-1-01	Plant and equipment	<u>530 000</u>	<u>508 437</u>
	Total BMR	<u>\$13 570 000</u>	<u>\$12 942 016</u>

TABLE 21979-80 Works Program

	BMR \$	DAS \$
Repairs and maintenance	8 600 (1)	(3)
Major new works	Nil	(3)
Minor new works	14 000	(3)
Furniture and fittings	4 000 (2)	

- (1) BMR may seek assistance from an allocation of \$8500 available to the Department over and above the allocation of \$8600..
- (2) Cash allocation. In addition approval has been given to enter into commitments estimated at \$80 000 to complete the supply and fitting of compactus units in the existing Cores and Cuttings Laboratory.
- (3) BMR is not advised of the funds available through Department of Administrative Services (DAS) as they form part of the total DAS program and such part will be undertaken as funds and priorities permit.

APPENDIX 1Publications issued during period 1/10/78 to 30/9/79Bulletins

- 156C. BANKS, M.R.** - Correlation chart for the Triassic System of Australia.
- 167. SENIOR, B.R., MOND, A. & HARRISON, P.L. - The geology of the Eromanga Basin.
- 184. RICH, P.V.** - The Dromornithidae - a family of large extinct ground birds endemic to Australia.
- 195. DAVIES, P.J. - Marine geology of the continental shelf off southeast Australia.
- 200. DRUCE, E.C.* & RADKE, B.M. - The geology of the Fairfield Group, Canning Basin, WA.

Reports

- 184. DENHAM, D. - An analysis of strong-motion accelerograms from Yonki, PNG, 1967-1972. (Microform MF10).
- 186. WILKES, P.G. - Acquisition, processing and interpretation of airborne gamma-ray spectrometry data. (Microform MF73).
- 191. HARRISON, P.L., & ZADOROZNYJ, I. - Officer Basin seismic, gravity, magnetic and radiometric survey, Western Australia, 1972. (Microform MF69).
- 193. SKWARKO, S.K. - Stratigraphic tables, Papua New Guinea. (Microform MF61).
- 200. BLACK, L.P. - Isotopic ages of rocks from the Georgetown/Mount Garnet/Herberton area. (Microform MF28).
- 201. WILLCOX, J.B. - The Great Australian Bight: a regional interpretation of gravity, magnetic and seismic data from the continental margin survey. (Microform MF25).

* former BMR officer

** non-BMR officer

- 203. MAJOR, J.A. - Mount Turner geophysical survey, Georgetown area, Queensland, 1976. (Microform MF93).
- 204. GERULA, W.J. - Catalogue of airborne magnetic and radiometric surveys up to December 1977. (Microform MF78 plus maps).
- 205. SPIES, B.R. - Combined ground geophysical survey - Alligator Rivers area, Northern Territory, 1975. (Microform MF29).
- 206. HONE, I.G., & MAJOR, J.A. - Ground geophysical surveys, Mary River area, NT, 1973. (Microform MF30).
- 207. McCracken, H. - Australian gravity network adjustment, 1975. (Microform MF68).
- 209. JOHNSON, R.W., & CHAPPELL, B.W.** - Late Cainozoic volcanoes of north-central New Britain and the Witu Islands, PNG. (Microform MF76).
- 211. DRUCE, E.C.* & SHERGOLD, J.H. - Annotated bibliography of the Georgina Basin, NT and Qld. (Microform MF77).
- 212. Geological Branch summary of activities 1978. (Microform MF81).
- 213. Geophysical Branch summary of activities 1978. (Microform MF97).
- 217. Abstracts of 8th BMR Symposium, Canberra, 1-2 May 1979. (Microform MF105).

BMR 78 - Yearbook of the Bureau of Mineral Resources.

Australian Mineral Industry Annual Review 1977

Australian Mineral Industry Quarterly

Vol. 31 (1978), Nos. 1, 2, 3, 4;
Vol. 32 (1979), No. 1.

BMR Journal of Australian Geology and Geophysics

Vol. 3, No. 4;
Vol. 4, Nos 1, 2, 3.

The Petroleum Newsletter

Nos. 74, 75.

Petroleum Exploration and Development Titles (Map and Key)
1 January 1978.

Mineral Resources Reports

9. KNIGHT, N.D. (comp.) - Australian molybdenum deposits.

1:250 000 Geological Maps and Explanatory Notes

BUNTING, J.A.** , JACKSON, M.J. & CHIN, R.J.** - Throssell, WA

CROWE, R.W.A.** - Cornish, WA

DODSON, R.G., & GARDENER, J.E.F. - Tennant Creek, NT

GRIMES, K.G.** - Mornington-Cape Van Diemen, Qld

HULEATT, M.B.* - Winnecke Creek, NT

HUTCHISON, D.S.* & NORVICK, M.S.* - Wewak, PNG

JACKSON, M.J. - Robert, WA

KENNEWELL, P.J., - Green Swamp Well, NT

KENNEWELL, P.J., & OFFE, L.A. - Lander River, NT

PIETERS, P.E. - Port Moresby-Kalo-Aroa, PNG

STRUSZ, D.L. - Canberra, ACT & NSW (reprint)

TOWNER, R.R. - Ryan, WA

TOWNER, R.R. - Ural, WA

TOWNER, R.R. - Wilson, WA

Van de GRAAF, W.J.E.** & BUNTING, J.A.** - Plumridge, WA

YEATES, A.N. - Percival, WA

YEATES, A.N., & CHIN, R.J.** - Tabeltop, WA

YEATES, A.N., & TOWNER, R.R. - Sahara, WA

Preliminary geological maps

1:100 000

Adam (Special), NT
Aileron, NT
Cloncurry, Qld
Duchess, Qld
Fergusson Range, NT

Howship, NT
Oenpelli, NT
Malbon, Qld
Undoolya, NT

1:250 000

Broome, WA
 Joanna Springs, WA
 Lagrange, WA
 McLarty Hills, WA

Mandora, WA
 Munro, WA
 Patterson Range, WA
 Port Hedland/Bedout Island, WA

1:500 000

Ngalia Basin, NT

1:1 000 000

Wiso Basin, NT

Special maps on the Pine Creek Geosyncline

Geology	}	1:500 000
Gravity		
Magnetic		
Radiometric		

Gravity maps

1:5 000 000 Gravity Map of Melanesia

Total Magnetic Intensity Maps

Alcoota, NT	}	1:250 000
Cloncurry, Qld		
Westmoreland, Qld		

APPENDIX 2

Records issued on open file during period 1/10/78 to 30/9/79

- 1969/145. BROWN, M.C.* - The Proterozoic Barney Creek Formation and some associated carbonate units of the McArthur Group, N.T.
- 1972/20. GLIKSON, A.Y., & HENLEY, S.* - A computer-oriented edge-punch card for storage and retrieval of petrographic and geochemical data.
- 1972/96. WYATT, B.W.- Pre-survey report on Alcoota regional and Arltunga detailed airborne geophysical surveys, NT, 1972.
- 1973/88. HANSEN, R.J.* & WILSON, E.G. - Investigation for gravel, Monaro Highway, Williamsdale, A.C.T.
- 1971/141. NORVICK, M.* - Permian and late Carboniferous palynostratigraphy of the Galilee Basin, Queensland.

- 1976/68. MENDUM, J.R.* & TONKIN, P.C.* - Geology of the Tennant Creek 1:250 000 Sheet area, NT.
- 1977/35. WYATT, B.W. - Aeromagnetic survey of Glenburgh, Robinson Range, Peak Hill, Nabberu and Stanley 1:250 000 Sheet areas, W.A. 1972.
- 1977/41. MOORE, R.F., KERR, D.W.*, VOZOFF, K.** & KUPP, D.L.** - Southern Cooper Basin magneto-telluric survey 1974.
- 1978/32. GARDNER, C.M. - Precambrian geology of the Westmoreland region, northern Australia. Part 111: Nicholson Granite Complex and Murphy Metamorphics.
- 1978/33. PASSMORE, V.L. - Explanatory notes to accompany stratigraphic columns - Carnarvon Basin, Australia.
- 1978/38. PASSMORE, V.L. - Laura Basin explanatory notes and stratigraphic correlations.
- 1978/46. BLAKE, D.H., DONCHAK, P.J.T.** & BULTITUDE, R.J. - Precambrian geology of the Dajarra 1:100 000 Sheet area, Qld - Preliminary data.
- 1978/47. ROBERTSON, C.S., CRONK, D.K.*, LOCKWOOD, K.L., & MAYNE, S.J.* - A review of petroleum exploration and prospects in the Carnarvon Basin.
- 1978/48. GLIKSON, A.Y., & DERRICK, G.M. - Geology and geochemistry of Middle Proterozoic volcanic belts, Mount Isa/Cloncurry, northwestern Queensland.
- 1978/49. ROBERTSON, C.S., CRONK, D.K.*, NICHOLAS, E., & TOWNSEND, D.G.* - A review of petroleum exploration and prospects in the Arafura Sea - Gulf of Carpentaria region.
- 1978/50. Von STACKELBERG, V.** & others - Notes on the sedimentology and palaeontology of cores and dredged sediments obtained from the Scott Plateau and Java Trench by R.V. Valdivia, 1977.
- 1978/54. JACKSON, M.J., & others - Field work report, McArthur Basin Project, 1977.
- 1978/55. CULL, J.P. - Results of the 1976 Canning Basin geothermal survey.
- 1978/56. SAMPATH, N. - Geophysical investigations of minor zones of mineralisation in the Cloncurry 1:250 000 Sheet area, Qld, 1973.
- 1978/57. HENDERSON, G.A.M. - Geology of the Gundaroo-Westmead Park-Nanima area, N.S.W.
- 1978/61. HILL, P.J. - Detection of subsurface ordnance by magnetic and by transient electromagnetic methods.
- 1978/63. SWEET, I.P., & HUTTON, L.J.** - Lawn Hill 1:100 000 Sheet areas: catalogue of 1:25 000 geological compilation sheets.
- 1978/64. WILSON, E.G. - The contamination of groundwater in urban areas by hydrocarbons, with brief notes on the hydrogeology of Canberra City, ACT.
- 1978/65. MUTTON, A.J., & OGILVY, R.D.* - Airborne and ground geophysical mapping in the Mount Basedow-Mount Partridge Range area, Alligator Rivers region, NT, 1974.
- 1978/66. ROBERTSON, C.S., NICHOLAS, E., & TOWNSEND, D.G.* - A review of petroleum exploration and prospects in the Perth Basin.

- 1978/68. EVANS, R., BENNETT, D.G.* & JACOBSON, G. - Geological and geophysical investigations of five alternative landfill sites, South Canberra and Tuggeranong, A.C.T., 1976.
- 1978/69. EVANS, R., & BENNETT, D.G.* - Geological and geophysical investigation of the proposed Mugga South landfill site, A.C.T., 1977.
- 1978/73. GREGSON, P.J. - Mundaring Geophysical Observatory Annual Report, 1977.
- 1978/82. BRISCOE, G.*, KELLETT, J.R., & JACOBSON, G. - Canberra-Queanbeyan relationship study: geological factors in development planning.
- 1978/83. JACOBSON, G. - The establishment of a leachate monitoring system at the West Belconnen landfill site, ACT, 1967-77.
- 1978/84. HENDERSON, G.A.M. - Googong pipeline, A.C.T. and N.S.W. Geological mapping of excavations during construction 1977-78.
- 1978/85. SPIES, B.R. - Interpretation of transient electromagnetic measurements using the apparent conductivity concept.
- 1978/88. COLWELL, J.B., & BURNE, R.V. - Drilling in the Spencer Gulf area of South Australia, February and March 1978.
- 1978/89. Geological Branch Summary of Activities 1978.
- 1978/93. Operations Branch Summary of Activities 1978.
- 1978/95. Petroleum Exploration Branch Summary of Activities 1978.
- 1978/96. HARVEY, N.*, DAVIES, P.J., & MARSHALL, J.F. - Shallow reef structure: southern Great Barrier Reef.
- 1978/97. Geophysical Branch Summary of Activities 1978.
- 1978/98. Mineral Resources Branch Summary of Activities 1978.
- 1978/102. Interim Engineering Services Branch Summary of Activities 1978.
- 1978/106. PETRIE, E. - Wells and metres drilled for petroleum exploration and development in Australia in 1977.
- 1978/109. LOCKWOOD, K. - A summary of the regional geology, geophysics, and petroleum potential of the Clarence-Moreton Basin.
- 1978/112. BULTITUDE, R.J., BLAKE, D.H., & DONCHAK, P.J.T.** - Precambrian geology of the Duchess 1:100 000 Sheet area, northwestern Queensland - preliminary data.
- 1978/114. WYATT, B.W. - Operational report on Broken Hill detailed airborne magnetic and gamma-ray spectrometer survey.
- 1978/116. WYATT, B.W. - Operational report on Broken Hill regional airborne magnetic and gamma-ray spectrometer survey.
- 1979/1. HILL, P.J. - Geophysical groundwater investigation, Upper Yass Valley, NSW.
- 1979/2. DENHAM, D. - The crust and upper mantle of southeast Australia - summaries of papers presented at a symposium held in Canberra, February 1979.
- 1979/6. HILL, P.J. - Magnetic and gravity survey, Mawson-Molodezhnaya region, Antarctica, 1975-76.
- 1979/8. WYBORN, L*, WYBORN, D., & FERGUSON, J. - CUMSEA 1979: Excursion guide.
- 1979/12. MACKENZIE, D.E., WITHNALL, I.W.** & BAKER, E.M.** - Forest Home, North Head, and parts of Gilbert River and Esmeralda 1:100 000 geological sheets: catalogue of preliminary field data compilation sheets.

- 1979/13. Abstracts: 8th BMR Symposium, Canberra, 1-2 May 1979.
 1979/14. WARD, J., & McLEOD, I.R. - Mineral resources of Australia, 1979.
 1979/15. PLUMB, K.A. - McArthur Basin research project, progress report for September quarter 1978.
 1979/16. PLUMB, K.A. - McArthur Basin research project progress report - December quarter 1978.
 1979/17. SHERGOLD, J.H. - Georgina research: December quarter 1979.
 1979/19. PIETERS, P.E., RYBURN, R.J., & TRAIL, D.S. - Geological reconnaissance in Irian Jaya, 1976 and 1977.
 1979/21. DAVIES, P.J., & others - A rock and sediment drill for use on coral reefs.
 1979/22. PASSMORE, V.L. - Carpentaria and Karumba Basins explanatory notes and stratigraphic columns.
 1979/25. BAUER, J.A., MATHUR, S.P., STAGG, H.M.J., & HARRISON, P.L. - A proposal for a seismic survey in the western Darling Basin, NSW.
 1979/26. EXON, N.F. - Preliminary deep-sea sampling results. R.V. Sonne geological cruises off Western Australia in 1979.
 1979/30. THIEME, R.* - Bureau of Mineral Resources 1979 program.
 1979/31. FITZSIMMONS, J. - Miscellaneous chemical, petrographic, and mineragraphic investigations carried out in the geochemical laboratory - January-December 1978.
 1979/39. SHERGOLD, J.H. - Georgina research: March quarter 1979.
 1979/40. WALTER, M.R., & others - Holocene carbonate environments in South Australia and Western Australia.
 1979/42. Workshop on Antarctic geology, 17-18 May 1979: abstracts.
 1979/43. SPIES, B.R. - TEM scale model investigations, February-March 1979.
 1979/46. MCGREGOR, P.M. - Estimating the geomagnetic secular change at Mawson, Antarctica.

APPENDIX 3

Data released through the Australian Government Printer copy service during period 1/10/78 to 30/9/79

A. Photoscale geological compilations

1:100 000 sheet areas

Alsace, Qld (16 sheets at 1:26 000)
 Ardmore, Qld (12 sheets at 1:26 000)
 Esmeralda (part), Qld (4 sheets at 1:25 000)
 Forest Home, Qld (16 sheets at 1:25 000)
 Gilbert River (part), Qld (4 sheets at 1:25 000)
 Gregory Downs, Qld (2 sheets at 1:50 000)
 Mount Angelay, Qld (12 sheets at 1:26 000)
 Mount Merlin, Qld (12 sheets at 1:26 000)
 North Head, Qld (16 sheets at 1:25 000)
 Riversleigh, Qld (16 sheets at 1:25 000)
 Selwyn, Qld (12 sheets at 1:26 000)

1:500 000

Solid geology of the Pine Creek Geosyncline.

B. Marine Geophysical Survey 1970-73 final track maps 1:1 000 000

SA54 (Wewak)	SE50 (Rowley Shoals)
SA55 (Admiralty Islands)	SE55 (Townsville)
SA56 (Kavieng)	SE56
SB55 (Lae)	SE57
SB56 (Rabaul)	SF56 (Rockhampton)
SC51	SF57
SC52 (Melville Island)	SG56 (Brisbane)
SC55 (Port Moresby)	SG57
SC56 (Woodlark Island)	SH57 (Lord Howe Island)
SD51 (Brunswick Bay)	SH58 (Norfolk Island)
SD55 (Cooktown)	SJ57
SD56	

C. Airborne geophysical maps

(Key: 1 = Magnetic contours. 2 = Magnetic profiles.
 3 = Total-count radiometric contours. 4 = Total-count
 radiometric profiles. 5 = Potassium radiometric profiles.
 6 = Uranium radiometric profiles. 7 = Thorium radiometric
 profiles. 8 = Radioaltimeter profiles. 9 = Flight
 lines. * = revised edition.)

(i) 1:100 000 Sheet areasNorthern Territory

Ehrenberg Range (1, 2, 4, 5, 6, 7, 8, 9)

(ii) 1:250 000 Sheet areasNorthern Territory

Bauhinia Downs (1, 3), Calvert Hills (1, 3),
 Darwin (2*), Hodgson Downs (1, 2*, 3), Mount
 Young (1, 2*, 3), Pellew (1, 2, 3), Robinson
 River (1, 3), Roper River (1, 3), Tanumbirini
 (1, 3), Urapunga (1, 3), Wallhallow (1, 3).

Western Australia

Bremer Bay (2, 3, 4, 5, 6, 7, 8, 9), Corrigin
 (2, 9), Kellerberrin (2, 9), Mount Barker (2, 4,
 5, 6, 7, 8, 9), Pemberton (2, 3, 4, 5, 6, 7, 8, 9),
 Perth, (2, 9) Pinjarra (2, 9).

South Australia

Adelaide (part)/Renmark (2, 4, 5, 6, 7, 8, 9),
 Barker (part)/Pinnaroo (2, 4, 5, 6, 7, 8, 9),
 Coompana (2), Fowler/Nuyts (2), Nullarbor (2).

Queensland

Cape Melville (2, 9*), Ebagoola (2, 3, 9*),
 Holroyd (2, 3, 9*).

NSW and ACT

Canberra (2), Wagga Wagga (2).

(iii) 1:1 000 000 Sheet area (Magnetic contours revised)

Canberra, NSW & ACT; Kalgoorlie, WA;
 Lake McKay, NT & WA; Melville Island, NT;
 Nullarbor Plain, SA & WA; Petermann Ranges,
 NT, SA & WA; Port Augusta, SA; Roper
 River, NT; Sydney, NSW; Wiluna, WA.

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JANITOR	V. Mraz

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MINERAL ECONOMIST CLASS 4	*A.J.B. Driessen, A.M.Aus.I.M.M. D. Perkin, B.A., B.Econ., A.M.Aus.I.M.M.

* Acting in that position

6.

MINERAL ECONOMIST CLASS 3	A.J. Gourlay, B.Sc. *K.R. Patterson, B.Sc.(Hons)
MINERAL ECONOMIST CLASS 2	G. Hillier, A.W.A.S.M., A.M.Aus.I.M.M. *N.D. Knight, B.Sc., Dip.Ed. C.R. Pratt, B.Sc., A.M.Aus.I.M.M.
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PETROLEUM TECHNOLOGIST CLASS 3	J.M. Henry, A.C.S.M., A.M.Aus.I.M.M., M.S.P.E. P. Duff, F.M.T.C., M.Aus.I.M.M. L. Kurylowicz, B.Sc.
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CHEMIST CLASS 2	K.S. Jackson, M.Sc., Ph.D.
PETROLEUM TECHNOLOGIST CLASS 2	S. Ozimic, B.Sc.
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ROTARY DRILLING SUPERVISOR GRADE 2	L.T.J. Hodgins J.B. Morgans
ROTARY DRILLING SUPERVISOR GRADE 1	B.G. Findlay
ROTARY DRILLER GRADE 2	E.H. Cherry A. Zoska
ROTARY DRILLER GRADE 1	*J.L. Henry K. Huth L. Keast E. Lodwick T. Shanahan
MECHANIC	A. Crawford T. Johnson J. Keyte

GEOLOGICAL BRANCH

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GEOLOGIST CLASS 3	J.H.C. Bain, M.Sc. D.H. Blake, B.Sc. (Hons), D.Phil.

* Acting in that position

GEOLOGIST CLASS 3 (cont)

*D. Burger, M.Sc., Ph.D.
 R.V. Burne, B.Sc.(Hons), D.Phil.
 G. D'Addario, D.Sc.
 P.J. Davies, B.Sc., Ph.D.
 N.F. Exon, B.Sc.(Hons), Ph.D.
 A.Y. Glikson, M.Sc., Ph.D.
 *M.J. Jackson, B.Sc.(Hons)
 G. Jacobson, B.Sc.
 R.W. Johnson, B.Sc.(Hons), Ph.D.,
 A.R.C.S., D.I.C.
 D.H. McColl, B.Sc., F.G.A.A.
 R.S. Needham, B.Sc. (Hons)
 R.W. Page, B.Sc.(Hons), Ph.D.
 W.D. Palfreyman, B.Sc. (Hons)
 P.E. Pieters, D.Geol.
 M.D. Plane, B.Sc.(Hons), M.A.
 C.E. Prichard, B.Sc.
 D.C. Purcell, B.Sc.
 G.P. Robinson, B.S.(Hons), Ph.D.
 R.J. Ryburn, M.Sc.
 B. Senior, M.Sc., Ph.D.
 *J.W. Sheraton, M.Sc., Ph.D.
 C.J. Simpson, B.Sc., A.M.Aus.I.M.M.
 S.K. Skwarko, M.Sc., Ph.D.
 R.D. Shaw, B.Sc.(Hons), D.I.C., M.Sc.
 *A.J. Stewart, M.Sc., Ph.D.
 D.L. Strusz, B.Sc.(Hons), Ph.D.
 R.J. Tingey, B.Sc.(Hons)
 D.S. Trail, B.Sc.(Hons)
 A.T. Wells, B.Sc. (Hons)

CHEMIST CLASS 3

J. Ferguson, B.Sc.(Hons), Ph.D.
 A.D. Haldane, B.Sc., A.R.A.C.I.

GEOLOGIST CLASS 2

R.S. Abell, B.Sc.(Hons), M.Sc.
 L.P. Black, B.Sc.(Hons), Ph.D.
 *C.M. Brown, B.Sc.(Hons), M.Sc. D.I.C.
 *R. Bultitude, M.Sc.
 I.H. Crick, B.Sc.(Hons), Dip.Ed.
 M.A. Habermehl, M.Sc., Ph.D.
 G.A.M. Henderson, B.Sc.
 P.D. Hohnen, B.Sc.
 P.J. Kennewell, B.Sc.
 D.E. MacKenzie, B.Sc.(Hons)
 J.F. Marshall, B.Sc.(Hons)
 *J.E. Mitchell, B.Sc.(Hons)
 *K. Modrak, B.Sc.
 A. Mond, Provmany Geol.
 R.S. Nicoll, B.Sc., M.A., Ph.D.
 *L.A. Offe, B.Sc.(Hons)
 B.S. Oversby, M.A., B.Sc., Ph.D.
 M. Owen, B.Sc.(Hons), Ph.D.
 D.J. Pigram, B.Sc.(Hons)
 G. Seidel, Vor-Diplom(Geophysics), D.I.C.

GEOLOGIST CLASS 2 (cont)

*P.G. Stuart-Smith, B.Sc.(Hons)
 I.P. Sweet, B.Sc.(Hons)
 J.G. Tomlinson, B.Sc.(Hons)
 R.R. Towner, B.Sc.(Hons)
 E.M. Truswell, B.Sc.(Hons), Ph.D.
 P. Vandenbroek, B.Sc.
 *D.A. Wallace, B.Sc.(Hons)
 R.G. Warren, B.Sc., M.Sc., D.I.C.
 A.N. Yeates, B.Sc.(Hons)
 *G.C. Young, B.Sc.(Hons) Ph.D.

CHEMIST CLASS 2

B. Cruikshank, B.Sc.(Hons), Ph.D.,
 A.R.A.C.I.
 *G.R. Ewers, B.Sc.(Hons), Ph.D.

GEOPHYSICIST CLASS 4

B.C. Barlow, B.Sc.(Hons), A.A.I.P.

GEOLOGIST CLASS 1

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 W.R. Evans, B.Sc.
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 A.L. Jacques, B.Sc.(Hons)
 J.R. Kellett, B.Sc.
 J. Knutson, B.A.(Hons), Ph.D.
 B.M. Radke, B.Sc.(Hons), Ph.D.
 P.A. Scott, B.Sc.(Hons)
 S. Shafik, B.Sc., M.Sc.
 D. Wyborn, B.Sc.(Hons)
 L.A. Wyborn, B.Sc.(Hons), Dip.Ed.,
 Ph.D.

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 D. Fitzsimmons
 F. Hadzell
 K. Heighway, Dip.Appl. Geol.
 J.G. Pyke
 T. Slezak, Dip.Anal.Chem.
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TECHNICAL OFFICER GRADE 1

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 N. Davis
 H.M. Doyle
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CLERICAL ASSISTANT GRADE 4	L. Kay J. Morrissey
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GEOPHYSICIST CLASS 3 (cont)

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 *F.J. Taylor, B.Sc.(Hons)
 D.H. Tucker, B.Sc.(Hons), Ph.D.,
 A.M.Aus.I.M.M.
 P. Wellman, M.Sc., Ph.D.
 J.B. Willcox, B.Sc.(Hons)

GEOPHYSICIST CLASS 2

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 *D.G. Bennett, B.Sc.(Hons)
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 J.P. Cull, B.Sc.(Hons), Ph.D.
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 *P.R. Gidley, B.Sc.(Hons)
 K. Horsfall, B.Sc.
 G.D. Karner, B.Sc.(Hons)
 J.A. Major, B.Sc.
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 E.P. Paull, B.Sc.(Hons)
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 P.A. Symonds, B.Sc.(Hons)
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 I. Zadoroznyj, B.Sc.(Hons)

GEOPHYSICIST CLASS 1

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 P.M. Davies, B.Sc.(Hons)
 V. Dent, B.Sc.
 B.J. Drummond, B.Sc.(Hons)
 B.A. Gaull, B.Sc.
 I. Hone, B.Sc.(Hons)
 H. McCracken, B.Sc.(Hons)
 M.J. Sexton, B.Sc.(Hons)
 H.W. Stagg, B.App.Sc.(Hons)
 J. Van Son, Dip.Geophys.
 K. Wake-Dyster, B.Sc.(Hons)

SENIOR TECHNICAL OFFICER
GRADE 2

*J.K. Grace

TECHNICAL OFFICER GRADE 2

R. Dulski
 *D. Gardner

* Acting in that position

TECHNICAL OFFICER GRADE 2
(cont)

G.S. Jennings
W. Meyer
G. Woad

TECHNICAL OFFICER GRADE 1

V. Carberry
T. Hegvold
H.R. Hughes
B.J. Page
D. Pfister
G.B. Price
P. Swan
G.H.Y. Thomas

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*E.C. Chudyk
P. Fowler
D.H. Francis
H.G. Reith
J.F. Salib
E. Smilek
S.J. Wilcox

CLERK CLASS 5

P.J. O'Rourke

CLERICAL ASSISTANT 3

Y. Moiler

COMPUTING ASSISTANT

U. Hammerling

FIELD ASSISTANT

R.D.E. Cherry
L.O. Rickardsson
A. Takken

ENGINEERING SERVICES SECTION

GEOPHYSICIST CLASS 5

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GEOPHYSICIST CLASS 4

K. Seers. B.Sc., A.A.I.P., A.M.I.E.E.

GEOPHYSICIST CLASS 3

Y.S.B. Liu, B.E., M.E.Sc., M.I.E.E.,
M.I.E.Aust.
P.E. Mann, B.Sc., Grad.A.I.P.

GEOPHYSICIST CLASS 2

R. Cobcroft, B.Sc., Grad.Dip.App.Geoph.
A.B. Devenish, B.Sc.
M. Gamlen, B.Sc.(Hons)

SENIOR TECHNICAL OFFICER
GRADE 2

*G. Thom

SENIOR TECHNICAL OFFICER
GRADE 1

W. Burhop
*G.A. Green
J. Rutledge
A. Zeitlhofer, Dip.B.I.E.T.

* Acting in that position

TECHNICAL OFFICER GRADE 2	R. Curtis-Nuthall J.W. Eurell W. Greenwood R.B. Grigg K. Jurello *A. Kores A.S. Scherl
DRAFTSMAN GRADE 2	R. Gan
DRAFTSMAN GRADE 1	*K. Mort
TECHNICAL OFFICER GRADE 1	W. Gunner S. Ioannou C.J. Rochford *G. Russell-Smith D.O. Stevens M.H. Tratt
TECHNICAL ASSISTANT GRADE 2	L.S. D'Arcy D. Foulstone W. Harkness G. Lockwood E.C. McIntosh L. Miller S. Prokin R. Westmore
FIELD ASSISTANT	D. Saunders
MAINTENANCE MECHANIC	D.K. McIntyre
MOTOR DRIVER	D.L. Gibbs

Officers under Contract to Geological Survey of Papua New Guinea
at 31 October 1979

<u>Name</u>	<u>BMR Designation</u>
R.A. Almond	Geophysicist Class 2
I. Ripper	Geophysicist Class 2
G.K. Anderson	Geologist Class 1
H.L. Davies	Geologist Class 4
G.D. Knight	Draftsman Grade 2
P. Hill	Geophysicist Class 2

Officers on Study Leave at 31 October 1979

B. Drummond	A.N.U., Canberra
J. Mutter	Columbia University, New York

* Acting in that position