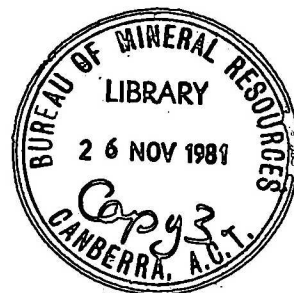


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# BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

## RECORD

1981/69

Mineral Resources Branch:

Summary of Activities for 1981

1981/69

Mineral Resources Branch:

Summary of Activities for 1981

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## FOREWORD

J. Ward

(Assistant Director, Mineral Resources)

As in recent years the work of the Mineral Resources Branch in 1981 was concentrated in two main areas - the assessment of Australia's mineral resources on a national scale, and studies of those aspects of the national and international mineral industry necessary for this assessment. In line with the changed role for BMR, the work of the Branch increasingly emphasised the quantitative assessment of mineral resources. While most emphasis was placed on the review of the identified resources of those minerals of major economic importance a move was made to quantify available resources of minerals which, although not so important economically, are gaining increased prominence because of their strategic/critical connotations. Of particular interest and satisfaction was the resource data and scientific and technical advice provided to the Commonwealth/State Joint Study Group on Raw Materials Processing during the year.

To date most of the resource assessment work has considered only identified resources and this has been restricted mainly to the demonstrated (measured and indicated) category. In line with its new and upgraded role of a geoscientific research organisation and its enhanced role in relation to the exploration for and assessment of mineral resources, BMR is actively recruiting geoscientific expertise not at present available within the organisation. Availability of deposit geologists, mineral commodity specialists, geomathematicians and the like will enable systematic work on mineral potential and undiscovered resources to be undertaken.

An overview of the mineral industry is necessary to monitor and analyse the effects of events and project developments and proposals which influence mineral supply and demand and in turn the cost of production and price of minerals/metals, important parameters in resource assessment work. Such work also enables the Branch to provide prompt, authoritative, scientific advice on the mining industry to both Government



2.

and the private sector. Notwithstanding numerous calls on their time, staff have largely met the deadline for information, advice, publications and lectures imposed on them, and my thanks for their efforts are due to all the staff involved.

While staff ceilings and long recruitment lead times continue, it is accepted that, in keeping with other Branches within the Bureau, the Mineral Resources Branch must operate below strength. However, I feel that special attention must be drawn to the Mining Engineering Section. The standard and qualifications required and the salary offered are such as to put Government at a disadvantage vis-a-vis the private sector in the recruitment of mining engineers. Only one of the three positions in the Mining Engineering Section was filled during 1981, and even this position became vacant when the incumbent retired in October. It is hoped that this deficiency will be rectified early in the coming year.

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## MINERAL ECONOMICS SECTION

### INTRODUCTION

The Section's two broad and inter-related functions, which it carries out more or less continuously, are to study the various sectors of the Australian mineral industry as well as to assess and re-assess Australia's mineral reserves and resources. As a result of this work, by virtue of the information that it gathers and compiles, the Section is also able to respond to the many requests for information it receives from Government, the industry, and the public, as well as to publish information on a regular basis.

Although the Section's work concentrates on the Australian mineral industry and on Australia's mineral resources, the scope of its work, of necessity, also extends worldwide because of the industry's international character and its dependence on overseas markets for the sale of its products.

The Section's programmed studies of the mineral industry follow two main lines - commodity overviews and specific studies. As well, the Section's Mineral Economists spent 20 percent of their available time on unprogrammed, ad-hoc, work generated from the many enquiries put to it. Such enquiries and requests for information come not only from the Department of National Development and Energy, but also from other departments such as Trade and Resources, Industry and Commerce, and Treasury, as well as from agencies such as the Industries Assistance Commission (IAC), the National Energy Advisory Committee (NEAC), National Energy Research Development and Demonstration Council (NERDDC), the Office of National Assessments (ONA), Trade Practices Commission (TPC), Australian Industry Development Corporation (AIDC), and a range of private-sector institutions including banks, the media, sharebroking houses, industry groups and, of course, companies in the industry, not to mention educational institutions, foreign governments' legations and the general public. Many requests are met by fairly brief exchanges over the telephone which, while they may not account for much time, do have a disruptive influence on continuing studies. Alternatively, requests are met by the more time consuming means of written presentations or by personal visits.

Commodity overviews entail the ongoing task of continually monitoring all industry aspects of a particular commodity, from exploration to final consumption; the spectrum also includes production, transportation, processing and marketing. These studies, which on average accounted for 44 percent of commodity specialists' on-the-job time in the 12 months ended 31 October 1981, generate the broad information base on which the Section relies to answer the many queries put to it, and from which it draws the information it publishes. Commodity overviews also include the preparation of preliminary estimates of Australian resources of particular commodities, as well as revising such estimates each year; the results of such work are published on a regular basis.

Specific studies focus on detail of a particular aspect of the industry, such as the industry's potential for further processing, or on particular aspects of a commodity. Although detailed resource assessments might otherwise be considered as being part of specific studies, such work, because of its importance, is programmed and logged separately.

Officers of the Mineral Economics Section and the Mining Engineering Section, with assistance from the Australian Bureau of Statistics (ABS), are jointly the authors of the Australian Mineral Industry Annual Review and the Australian Mineral Industry Quarterly; details of publications and of papers published in the Quarterly or outside journals, as well as other releases such as Records, are listed separately in this summary. Because much of the Section's work depends on statistical data, it maintains a close working relationship with ABS, through the Statistical Officer (Mining), an ABS officer outposted to the Section. By arrangement with ABS, the Section also carries out some of its own, albeit small, statistical collections. The results of these collections are issued by BMR as statistical bulletins which are available for mineral sands, copper-lead-zinc, tin (quarterly), and sulphur-sulphuric acid-superphosphate (annually); a prices bulletin is issued monthly. The Section also prepares a series of 14 Preliminary Annual Summaries providing preliminary but timely statistics and commentary on developments concerning the more important commodities.

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COMMODITY OVERVIEWS

The fundamental importance of this work to the Section's modus operandi is indicated by the fact that 41 percent of the Section's staffed man-days was charged to this activity; of only Mineral Economists' staffed man-days, 36 percent was attributable to this work.

The wide coverage of commodity overview work as confirmed by the number of aspects studied (from exploration to final consumption), is repeated in the coverage of actual commodities; the Annual Review comprises some 60 commodity chapters or headings only three of which (petroleum, oil shale, and helium) are prepared outside the Section, by other Branches.

Although the emphasis of commodity overview work is on monitoring developments in the Australian industry, coverage is extended worldwide because of the Australian industry's integral relationship to the world scene and because Australia ranks so prominently among world suppliers of various mineral commodities, particularly bauxite, coal, iron ore, lead, mineral sands, nickel, tungsten and zinc, and as a potentially large supplier of uranium oxide.

Much of the information held in the Section has come from both government and industry sources, in Australia and overseas, as well as from many trade and technical journals, newsletters, and newspapers. The Section maintains a specialised library, a sub-library of BMR's main library, and indexes and references its own material. Some bibliographic references, particularly those pertaining to the Australian industry, have been provided as input to the Australian Earth Sciences Information System (AESIS). The responsibility for much of this indexing and information management work has been allocated to a Science 1 position which was, after remaining unfilled for most of 1980, filled again in May 1981.

As part of their ongoing commodity overview studies, Mineral Economists also maintain personal contact with their counterparts in government and industry. This is achieved mainly through field visits to companies' operations as well as to States' mines departments and

geological survey offices. The Section gratefully acknowledges the co-operation and goodwill given it by these organisations. Information is also exchanged with visitors to the Section, of which there were about 115 in 1981. Generally prominent among the range of callers are directors, executives and scientists of private sector and semi-government corporations (both Australian and from overseas), representatives of foreign legations, and Australian government officers. Some of the more distinguished visitors included Messrs P. Grimley and D. Johnston, Vice-Presidents of the Bank of Montreal; Mr I. Ostby, Bank of America; Mr C. Tyson, Manager, Uranium Resources, British Civil Uranium Procurement Organisation; Dr Massaharu Kamitani, Metal Mining Agency of Japan; Professor P. Laznika, University of Manitoba; Mr A. Todd, United Kingdom National Coal Board; Mr L. Davies, Manager, World Bureau of Metal Statistics; Mr K. Buck, Secretary General, International Lead-Zinc Study Group; Mr R. Hodgson, London Financial Times; Mr J. Calkins, Director, CRIB, USGS; and Mr Mohammed Hussain Qasim, Director of Minerals, Omani Ministry of Petroleum & Minerals.

Mineral Economists also participate in industry symposia, conferences, and courses, not only to keep up with latest developments, but also to make available the Section's expertise via discussion or the presentation of papers; details of participation are listed separately. The Section also provides speakers each year to the Department of Defence-sponsored Industrial Mobilisation Course.

#### SPECIFIC STUDIES OF THE AUSTRALIAN MINERAL INDUSTRY

The Section's capacity to carry out programmed specific studies was, as in previous years, severely curtailed by its commitment to respond to the many ad hoc enquiries put to it which, by their very nature, have overriding priority. Nevertheless, the Section did combine to prepare a paper entitled 'Forecast trends of Australian mineral production to the year 2000' which was subsequently delivered to the Aus.I.M.M. Annual Conference held in Sydney 20-24 July.

Normally, the specific studies project includes the preparation of feature articles for publication in the Quarterly Review. However, for the reason referred to above, only one article was prepared in the Section, by M. Huleatt, entitled 'Black coal in Australia'; this is to be published in AMIQ Review 34(2). The only feature article published during 1981 was contributed by D.L. Gibson of Geological Branch - 'Oil shale in Australia - its occurrence and resources' (AMIQ Review 33(2)).

Although reported as part of this work program last year, the progress made in resource assessment studies is now reported separately.

#### RESOURCE ASSESSMENTS

Notwithstanding the shift of emphasis towards resource assessment studies, in BMR's evolving role and program, only one detailed resource assessment was undertaken in 1981 - a chromite resource assessment by R. Pratt. The results of a detailed assessment of Australia's tin resources, carried out by D. Perkin and J. Erskine in 1979 and 1980, are still being written up. The Section's seemingly limited capacity to undertake resource assessment work, apart from constraints caused by limited man-power resources some of which must be directed to ad hoc work, also stems from the fact that the Branch has been unable to recruit mining engineers. Although the Branch's establishment provides for 3 engineering positions, only one of these positions, that of Chief Mining Engineer, was filled and then only for part of the year. Following E. Timoney's retirement as Chief Mining Engineer on 9 October, the Branch was without professional expertise in mining engineering.

The chromite resource assessment study has shown that Australia's resources of this mineral are much larger than hitherto reckoned. Demonstrated resources have been assessed as more than 2.5 Mt and appear to provide Australia with potential for total self-sufficiency in chromite for chemical and metallurgical use.

The major part of resources occur in Western Australia. Deposits at Coobina, previously considered to contain resources sufficient only to meet metallurgical requirements in an emergency, have now been

assessed to contain sufficient material to meet Australia's metallurgical as well as chemical grade requirement, and even to supply possible export markets. The characteristics of the deposit are such as would require large-scale development for which very detailed test work on mining and beneficiation techniques, as yet not attempted, would need to be carried out.

The assessment also confirmed the relatively small quantity of resources suitable for metallurgical and refractory use present in Eastern Australia. Deposits at Princhester, Qld, are the largest but would require beneficiation for use as a refractory.

Mining of alluvial chromite at Beaconsfield, Tas., in recent years has stimulated interest in alluvial sources of chromite for foundry use and possibly chemical and metallurgical uses as well; work on evaluating additional resources there could well extend the life of that operation. The assessment certainly indicates that further exploration in the region would be warranted.

The preliminary results of the tin resource assessment show that Australia's identified economic resources of tin stand at 363 000 t contained Sn, only 8 percent more than hitherto reckoned.

D. Wallace prepared a review of mineral resource assessment techniques used overseas, for the Director.

#### AD HOC SERVICES

The man-power statistics show that 20 percent of Mineral Economists' available time (staffed man-days minus leave) in 1981 was spent on unprogrammed, ad hoc, work; nearly two-thirds of this work originated from government sources and about one-third from the private sector. Although many of the ad hoc requests for professional assistance come from the Department of National Development and Energy, in the course of a year many other government departments, but particularly Departments of Trade and Resources and the Treasury (Foreign Investment

Review Board - FIRB) also make calls on the Section's services; in 1981 the Section prepared written comments on 78 FIRB proposals forwarded to it via Central Office. The substance and nature of enquiries has invariably tended to reflect levels and direction of government policy and commercial activity; in 1981 the emphasis was on commodities coal, aluminium, diamonds, refractories, and gold.

During the year, a considerable amount of the Section's time was again taken up in preparing contributions for various (Australia/Japan, Australia/Korea, Commonwealth/State) Joint Study Groups on Raw Materials Processing. Most of the information provided was incorporated in two unpublished papers prepared by Department of National Development and Energy - "Historical trends in the extent of raw materials processing in Australia" and "The Australian ferro-alloys industry supply potential". The activities of these Study Groups and their requirements for information continue, and are sustained by Australia's growing comparative advantage in providing the energy for raw materials processing. This shift towards further processing is particularly evident in the aluminium sector; in recent years aluminium smelting capacity has been increased at existing operations (Kurri Kurri and Bell Bay), new smelters are presently under construction at Gladstone, Qld and Portland, Vic. and two other new projects (Tomago and Lochinvar in New South Wales) are being considered. Plans for yet another smelter project (Bundaberg, Qld) were recently deferred because of falling aluminium prices.

In the broad spectrum of other ad hoc assignments the Section contributed to Division of National Mapping's Atlas of Australian Resources, prepared Professional Opinions commenting on an Environmental Impact Statement on uranium mining at Lake Way, W.A., and Honeymoon, S.A., prepared a mineral reserve assessment report on the Cobar, N.S.W., region, prepared (with Geological Branch) a Professional Opinion dealing with the potential for economic mineralisation (emphasis on copper and chromite) in the United Arab Emirates, and detailed Branch requirements for a coal data base. I. McLeod was involved in an AMIC-Aus.I.M.M. Committee reviewing man-power requirements for the Australian mineral industry, and J. Ward participated in discussions with the ABC on the production of a documentary film on energy aspects of mineral industry.



STAFF

Staffing at 31 October 1981 was as follows:-

Science 5 (Mineral Economist)	I. McLeod
Science 4 (Mineral Economist)	D. Perkin
Science 4 (Mineral Economist)	A. Driessen
Science 3 (Mineral Economist)	R. Pratt
Science 3 (Mineral Economist)	M. Huleatt (acting)
Science 2 (Mineral Economist)	vacant
Science 2 (Mineral Economist)	N. Knight
Science 2 (Mineral Economist)	C. Mock (on extended leave - position occupied by R. Towner)
Science 2 (Mineral Economist)	M. Roarty
Science 1 (Geologist)	D. Wallace
Clerk Class 4	S. Styles
Clerk Class 4	D. Cargill
Clerk Class 2/3	R. Weber
Clerical Assistant Grade 4	M. Santosuosso (on extended leave - position occupied by J. McGuire).

R. Pratt was promoted to a vacant Science 3 position in January 1981; his vacated Science 2 position was subsequently (June) filled by M. Roarty from Petroleum Exploration Branch. A. Gourlay retired from the Service on 18 September 1981 leaving another Class 3 position vacant; this was filled by M. Huleatt on temporary higher duties pending selection of an officer for permanent appointment. The position was, at year's end, being advertised.

D. Wallace was recruited to the Science 1 (Geologist) position, from Geological Branch, in May.

C. Mock commenced leave for an extended period (possibly a year) from July; her position is being filled, on a temporary basis, by R. Towner from Geological Branch.

S. Westerhuis was transferred from the Section's statistical group to Central Office, Department of National Development and Energy in February; D. Cargil, formerly from Department of Transport, was promoted to the vacated Clerk Class 4 position in April.

M. Santosuosso, Clerical Assistant Grade 4, also commenced leave for an extended period - from September; her position is being filled by J. McGuire, from Petroleum Exploration Branch, on temporary higher duties.

A Clerk Class 8 continues to be outposted to the Section from ABS, as Statistical Officer (Mining); the position was held by L. Wright throughout the year.

#### SYMPOSIA, CONFERENCES, LECTURES, COURSES

Details of Section Officers' participation and attendance during the year ended 31 October 1980 are shown below:

##### Lectures to meetings and conferences

- . Canberra College of Advanced Education - D. Perkin presented a lecture on evaluating mineral deposits to an undergraduate class of geology students (November 1980).
- . Indian National Minerals Convention, New Delhi, India - I. McLeod by invitation presented a paper entitled 'Development of Australian mineral resources' and, while in India, visited various mining operations and had discussions with officers of the Indian Bureau of Mines (February 1980).
- . BMR Tuesday morning lecture series - R. Pratt presented a paper 'Growth prospects for Australia's minerals in the 1980s' (February).
- . Industrial Mobilisation Course, Sydney, Melbourne and Perth - this course, sponsored by Department of Defence, invariably calls for a contribution from BMR by way of a paper on Australia's mineral resources. This paper, also made available by BMR as a Record, was presented by I. McLeod in Sydney (March) and Perth (July), and by J. Ward in Melbourne (July).

- . BMR's 10th Annual Symposium, Canberra - D. Perkin presented a paper 'Commodity targets - some relevant factors for Australian exploration' (May).
- . NSW Secondary School Teachers' In-service Training Course (conducted by Earth Resources Foundation, University of Sydney), Sydney - D. Perkin presented a lecture 'Minerals in New South Wales and Australia' (May).
- . International Superphosphate Manufacturers Association (ISMA) 49th Annual Conference, Singapore - A. Driessen delivered a paper 'The current status and long term outlook for Australia's phosphate resources' (May); P.J. Cook, Research School of Earth Science, ANU, is a joint-author of this paper.
- . Aust. I.M.M. Annual Conference, Sydney - A. Driessen delivered a paper 'Forecast trends of Australian mineral production to the year 2000' (July).
- . 5th Geological Society of Australia Congress, Perth - D. Perkin presented a paper 'The economic significance of uranium deposits through time' (August).
- . I. McLeod and M. Huleatt addressed a group of Japanese engineers and geologists visiting Australia (and BMR) under the auspices of the New Energy Development Organisation of Japan (February).

#### Attendances at conferences

- . 17th Session CCOP, Bangkok, Thailand, November, 1980; J. Ward attended as special advisor to the committee.
- . AMIC Symposium, Canberra, April - J. Ward and I. McLeod.
- . 51st Congress of ANZAAS, Brisbane, May - M. Huleatt.
- . First Mineral Sands Symposium, Sydney, May - J. Ward.
- . CRES seminar 'Resource development and the future of Australian society, Canberra, September - A. Driessen.

- . AIE seminar 'Government involvement in the energy sector', Canberra, September - A. Driessen.
- . Australian Minerals Industry Research Association Technical Meeting, Brisbane, September - M. Huleatt.
- . Fifth World Tin Conference, Kuala Lumpur, October - J. Ward.

Attendances at training courses and workshops

- . Canberra College of Advanced Education workshop 'Mineralisation in Tertiary sediments with particular reference to uranium', Canberra, November 1980 - D. Perkin.
- . AMF workshop 'Uranium geology and exploration', Sydney, February 1981 - D. Perkin.

D. Perkin is enrolled at James Cook University for a part-time, external, M.Sc. course in 'Mining and exploration geology'. As part of that course he spent two weeks at James Cook in February, and prepared a paper, presented by him in June as part of a course seminar, entitled 'Australian and World uranium industry (1943-1979)'.

(Part-time studies for higher or second degrees are obviously not part of BMR program; however candidates for certain PSB-approved courses do receive government support by way of paid leave, reimbursement of fees and, sometimes, travel funds). Section officers enrolled in courses for higher or second degrees in the current year are:

- D. Perkin (see above).
- C. Mock - Graduate Diploma in Economics - ANU.
- N. Knight - Graduate Diploma in Applied Economics - CCAE.
- D. Wallace - Graduate Diploma in Applied Economics - CCAE.
- D. Cargill - BA Management Science - CCAE.

PUBLICATIONS IN 1981Australian Mineral Industry Annual Review 1978Australian Mineral Industry Annual Review 1979Australian Mineral Industry Quarterly, Volume 33, Nos 2, 3 and 4;  
Volume 34, No. 1.

DRIESSEN, A., (in press) - Book reviews on companion volumes 'Fertiliser mineral potential in Asia and the Pacific' and 'Fertiliser mineral occurrences in the Asia-Pacific region' in Journal of Economic Geology.

DRIESSEN, A., & COOK, P.J., 1981 - The current status and long-term outlook for Australia's phosphate resources in Main raw materials resources in Asia and Oceania, published by ISMA Ltd.

DRIESSEN, A., 1980 - Indigenous sources of sulphur in Australia and Changes in sulphur supply in Australia in WOODCOCK, J.T., (editor), Mining and Metallurgical Practices in Australasia (Chapter 10). The Australasian Institute of Mining & Metallurgy.

McLEOD, I.R., 1980 - Xihuashan wolfram mine in The Australian Geological Delegation to China, 1979. Bureau of Mineral Resources, Canberra (compiled by A. Renwick).

MINERAL ECONOMICS SECTION, 1981 - Forecast trends of Australian mineral production to the year 2000. Sydney Conference, 1981. The Australasian Institute of Mining & Metallurgy.

MOCK, C.M., 1980 - Outline of Australian mineral industry in WOODCOCK, J.T., (editor), Mining and Metallurgical Practices in Australasia (Chapter 2). The Australasian Institute of Mining & Metallurgy.

WARD, J., & McLEOD, I.R., 1981 - Mineral Resources of Australia. Bureau of Mineral Resources Record 1981/3.

Articles published in the Australian Mineral Industry Quarterly:

'Oil shale in Australia - its occurrence and resources', by D.L. Gibson\* (Vol. 33(3)).

\* Geological Branch

'Australian Identified mineral resources, 1980' by Mineral Economics Section (Vol. 33(4)).

Assorted contributions include those by M. Huleatt and D. Perkin to a paper 'Australia's resources of energy minerals and their assessment' published in BMR 80; by I. McLeod to ATS Newsletter (published by Associated Tin Smelters); by various Commodity Specialists (but particularly M. Huleatt who wrote a paper 'The Australian black coal industry') to Jobson's Mining Year Book 1981; and contributions to Australian Encyclopaedia.

#### MINING ENGINEERING SECTION

The Mining Engineering Section is a small mining research and advisory group which provides information and advice to Government on topics such as mine feasibility and profitability, methods of mining, recommendations for development programs, and requests for mining assistance. The Section also provides assistance to the mineral resource assessment groups of BMR in their compilation of economic and subeconomic mineral resources, by providing capital and operating costs of mining projects. The Section provides a secretary for and participates in the Conference of State Mining Engineers. A schedule of State mining royalties and Australian Government mining tax provisions is kept up-to-date, together with State mining legislation amendments. In 1981 the Section further extended the use of computers in mine studies.

#### STAFF

Occupied positions (as at 31 October 1981)

NIL.

Mr Timoney, Engineer Class 5, retired on 9th of October 1981.

Interviews for the Chief Mining Engineer have been completed and a candidate has been recommended for the position.

### CONFERENCE OF STATE MINING ENGINEERS

The conference was held at the New Zealand Mines Department, Wellington, from 30 March to 3 April 1981. Further aspects of mine safety and mine operation were discussed, including aspects of recording accidents, mine plans and surveys, man cage arrestors, medical certification, the transfer of flammable fluids underground, and slurry pipe lines.

Mr Timoney acted as secretary to the Conference and completed Minutes of the Meeting for distribution to all States, as well as a summary for the Australian Minerals and Energy Council.

### VISITS TO MINES

Mr Timoney visited Tasmania and examined the narrow vein cut-and-fill tin mine at Aberfoyle, the operation mining remnant pillars at Storeys Creek, and the post pillar vertical mining operation at King Island. He also visited Kambalda Nickel Mines to view the slot method of stoping, Mt Charlotte Mine to view the mass designed pillar blasts, the Agnew Mine to inspect their decline access to cut-and-fill stopes, and the long hole open stope method of mining and the Teutonic Bore open-pit mining operation. The uranium pilot plant at Kalgoorlie was also visited.

### GOOGONG DAM PROJECT

The Project Executive Board, though extant, did not meet during the year.

### GENERAL ASSISTANCE TO GOVERNMENT DEPARTMENTS

Advice was given to:

Department of Business and Consumer Affairs re sampling procedures;

Department of National Development and Energy re mineral royalties;

The Northern Territory Department of Mines and Energy re comment on their Mining Assistance Ordinance;

Victorian Department of Economic Research re methods of assessing future requirements of quarry material;

Department of Trade and Resources re State mine leasing legislation;

Queensland Mines Department re solid/liquid slurry pipe lines;  
A.A.E.C. re underground filling of stopes.

Australian Development Assistance Agency

No work was undertaken for this Agency during the year.

Australian Atomic Energy Commission

Contact was maintained with the Commission's Mining Engineering Section; BMR forwarded its capital cost and operating cost index to the Section for its information and use.

RESOURCE ASSESSMENT STUDIES

Computer programs were written to test the sensitivity of variations in tax rate, royalty rate, price of commodity, operating cost, production rate, mine life, and capital cost on DCF-ROR analyses. A program incorporating triangular distributions for the variables capital cost, tonnes/year, royalty, recoveries, grade, price of product, secondary products, operating costs, life of mine, and currency exchange rates was also written to simulate a mining operation. The same program was modified to simulate capital and operating costs - taking account of up to 10 variables. A third program was written to assess the present value of a mine under different conditions of cut-off grade and average mine grade.

AUSTRALIAN MINERAL INDUSTRY ANNUAL REVIEW

The Section prepared the following items of the AMI Annual Review:

State mining royalties.

Government assistance to the mining industry.

Mining legislation (income tax and Federal Government levies).

Foreign investment policy.



AD HOC SERVICES

During the year the Section received many visitors and handled many ad hoc enquiries from mining companies, individuals, Government Departments, Universities and other agencies, on a wide variety of subjects associated with mining techniques, mineral resources, mining equipment, and mining feasibility determinations. As part of this work the Section prepared a broad outline of the carbon in pulp method of gold recovery, undertook a preliminary mine feasibility study of a small gold prospect in the Northern Territory, and gave advice on the re-treatment of old copper/gold tailings.