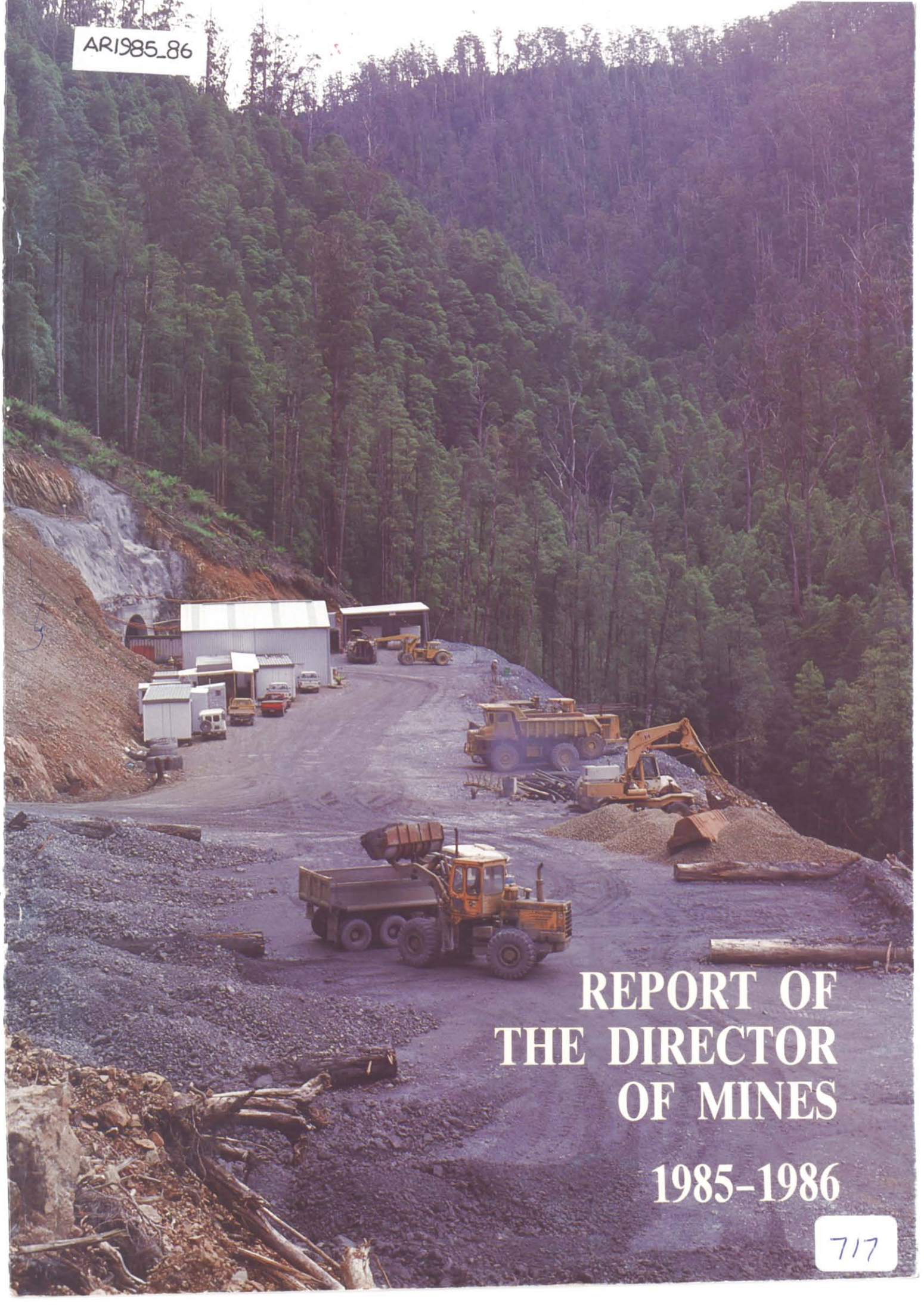

REPORT OF THE DIRECTOR OF MINES

1985–1986

The Department of Mines

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Cover: Surface workings at the Hellyer mine in western Tasmania. The adit enters the hillside behind the sheds.

1986 (No. 97)

1986

PARLIAMENT OF TASMANIA

DIRECTOR OF MINES

REPORT FOR THE YEAR ENDED 30 JUNE 1986

Presented to both Houses of Parliament by His Excellency's Command

By Authority:
A. B. CAUDELL, Government Printer, Tasmania

4265

EXECUTIVE COMMITTEE, DEPARTMENT OF MINES, DECEMBER 1986

Front (left to right)
R. C. THOMAS (Chief Inspector of Explosives)
H. MURCHIE, (Director of Mines)
M. R. HARGREAVES (Deputy Director of Mines)

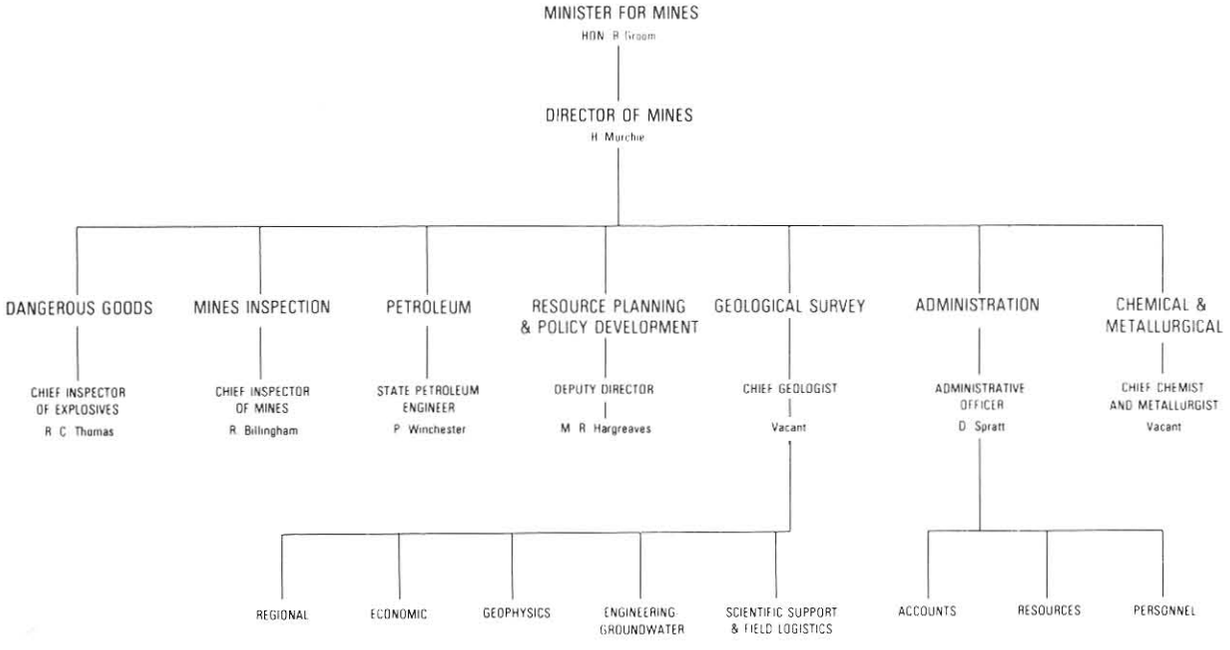
Rear (left to right)
P. W. BAILLIE (Acting Chief Geologist)
P. H. WINCHESTER (State Petroleum Engineer)
R. BILLINGHAM (Chief Inspector of Mines)
P. L. JAMES (Acting Chief Chemist and Metallurgist)
D. F. SPRATT (Administrative Officer)
M. GEEVES (Executive Officer)

REPORT OF DIRECTOR OF MINES 1985–86

Department Functions

- the administration of the State's mineral lands and the regulation of exploration activities onshore and offshore.
- the regulation of mines and works, and the enforcement of safety and occupational health standards.
- the regulation of the transport, storage and use of dangerous goods.
- the systematic assessment of the geology of the State and the provision of a geological data base.
- the responsible development of the State's mineral and energy resources.
- the provision of chemical and metallurgical research facilities.

DEPARTMENT OF MINES ORGANISATION CHART 1986



The Department supports the preservation of the State's mining history. The West Tamar Historical Committee have opened a museum in the old Grubb Shaft building at the former Tasmania Mine at Beaconsfield *(above)* to preserve relics from the period when Beaconsfield was a major mining centre. The West Coast Pioneers Museum at Zeehan houses a large collection of photographs, machinery and minerals. Department of Mines Executive Officer Gil Oakes and museum curator George Smith inspect a Departmental display *(below)* set up at Zeehan as part of the Mount Read Volcanics Project.

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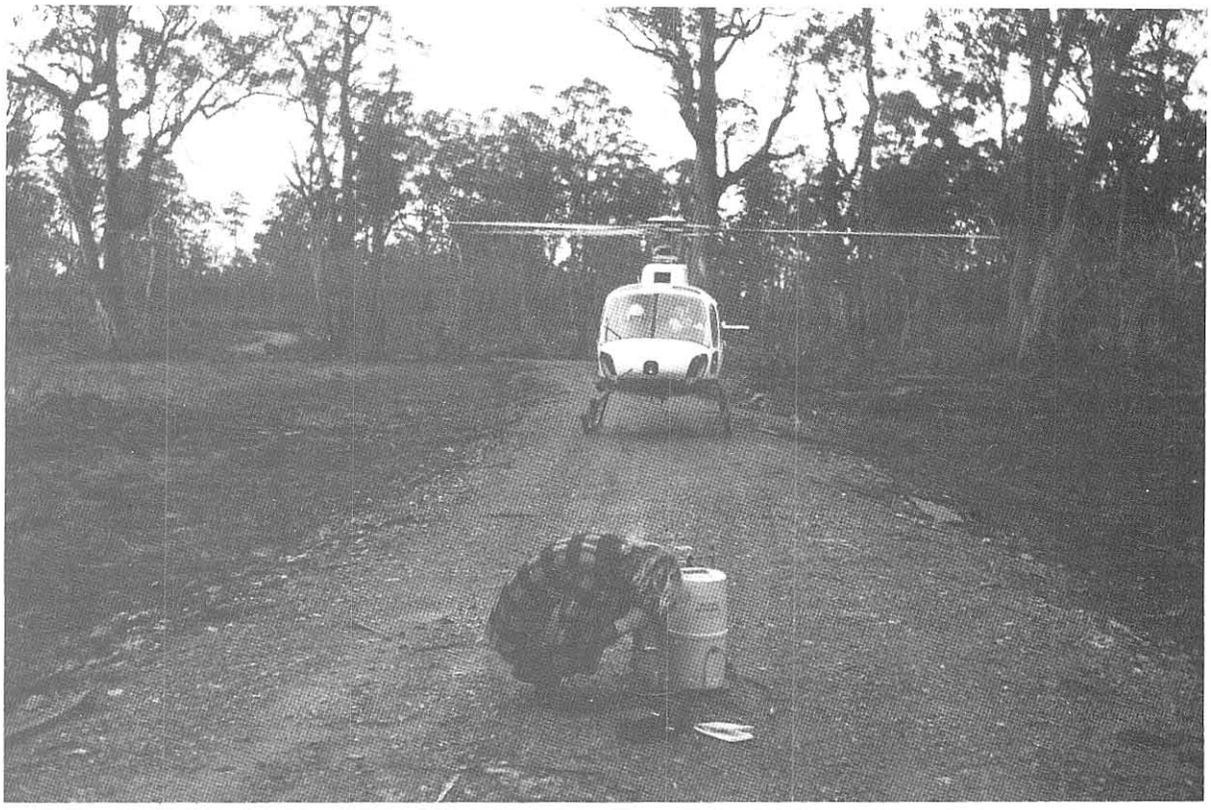


Field Assistant Pavel Ruzicka takes a gravity reading as part of a helicopter-based survey east of Waratah for the Mt Read Volcanics Project.

Roger Billingham, Chief Inspector of Mines *(left)* and Roy Thomas, Chief Inspector of Explosives *(centre)* inspecting a submersible on board the drillship Global Marine *Robert F. Bauer,* during drilling of Amoco's discovery well Yolla-1.

REPORT OF THE DIRECTOR OF MINES

TO THE MINISTER FOR MINES

Annual Report of the Department of Mines for the year 1985-86 submitted by the Director of Mines, Mr H. Murchie.

OVERVIEW

Two major events dominate the year under review. These were the collapse of the International Tin Council on 24 October 1985 and the reduction in the price of crude oil in early 1986. Both issues had a major effect on the Tasmanian Mining Industry and our efforts to maintain value of mineral production in the overall economy of the State.

The collapse of the International Tin Council was not unexpected as, for some time, it was apparent that the Buffer Stock Manager was having difficulty meeting his contractural commitments. Marketing and quota problems had reduced production from Renison to less than 60 per cent of capacity and the closure of the Cleveland Tin mine was anticipated. Cleveland Tin ceased production in June 1986 and the concentrator was converted for treatment of Hellyer ore. Renison, on the other hand, decided to increase production to maximum capacity and rely on their strong position with regard to ore reserves and relatively high grades to survive (whilst surplus stocks of tin overhang the market). It is anticipated to be a close-run battle to 'hang in there' whilst the competition is less than equal. Some governments may opt to produce 'social' metal by subsidising weak producers to the detriment of the industry as a whole. In any event, the prospects of further development of our considerable tin deposits must await the recovery which may well be some years away. The tin market will be carefully monitored to ensure no opportunity is missed to capitalise on our resources.

I reported last year with some optimism following the spudding of Yolla 1 on 8 June 1985. This was the first of six oil wells drilled in the 1985-86 exploration programme in the Bass Basin. The increase in activity was welcome after more than a decade in which little progress had been made following the drilling of the early 1970's by Esso-BHP.

Yolla 1 was suspended in October after drillstem tests produced oil and gas flows. It was followed by Tilana 1, also in permit T/14P, which was completed by 25 November 1985. Drillstem tests on Tilana were inconclusive and formation damage was suspected. Locations were declared over the Yolla and Tilana discoveries by the Tasmanian Minister for Mines, as Designated Authority, on 25 December 1985. Koorkah 1 was then drilled in permit T/18P and was abandoned as a dry hole on 26 December.

Pelican 5 was spudded in T/22P on 28 December as a further appraisal well on the Pelican field. This well was drilled to 4 627 m (14 000 feet), to be the deepest well in the basin. Well logging was encouraging and gas shows were encountered; however, extensive drillstem tests were less heartening and the well was plugged and abandoned in April 1986. The disappointing results in this well, together with the shock drop in oil prices, was sufficient to stem the impetus built up over the past year. Indeed, earlier in the year when Yolla 1 and Tilana 1 were being drilled, two oil rigs, the 'Diamond M. Epoch' and the 'Robert F. Bauer', were working simultaneously for the Amoco consortium and there was expectation that the programme would be vigorously pursued.

In early 1986 the Bridge Oil consortium drilled Chat 1 in T/15P and Seal 1 in T/19P. Both were plugged and abandoned as dry wells.

In the present climate it would be unrealistic to expect further major oil exploration activity in the near future. The latest results should provide a wealth of geological information and our aim will be to encourage a continuing exploration presence and commitment, whilst these results are evaluated. The next round of drilling will be critical and we must select the right targets. The discovery of new oil reserves is important to Australia and I hope the Bass Basin can assist to maintain a measure of self-sufficiency.

REVIEW OF THE YEAR

An environmental impact statement was submitted in October 1985 for a silicon smelter to be built at the site of the Carbide Works at Electrona. A licence to operate scheduled premises was granted by the Department of the Environment and construction is under way to establish a new industry.

In October 1985 King Island Scheelite abandoned their Bold Head Mine. Pumping ceased and it will be allowed to flood.

The new superphosphate granulation plant was opened at the Risdon Works of the Electrolytic Zinc Company early in 1986.

Mining operations ceased at the Hercules mine at Williamsford and rehabilitation has been successfully completed.

New clinker storage facilities are being constructed at the Goliath Cement Works to provide for better storage and distribution.

An expansion programme was commenced at the Heybridge works of Tioxide Australia Pty Ltd.

The Hellyer adit reached the ore body in May 1986 and drilling of ventilation raises had commenced.

The Mount Lyell Mining and Railway Company negotiated sales of pyrite concentrate with Japan.

A new concentrator is being constructed at Kara for Tasmania Mines scheelite mine.

At Renison, work resumed at the end of August 1985 following a nine-week strike which highlighted health and safety issues. The Department produced a simple guide to the Mines Inspection Act and regulations to better inform those employed in the mining industry of the legislation that covers them. The company drafted an internal industrial hygiene policy and formed a safety committee. The Gilberthorpe review of the Department's inspection services recommended strengthening occupational health and hygiene surveillance. Two industrial chemists were appointed for these duties during the year.

A joint one-day seminar organised by the Chamber of Mines and the Department of Mines was held in Burnie in April 1986, covering Occupational Health and Safety in Mines. It was opened by the Minister for Mines, the Hon. R. J. Groom, M.H.A. and 120 delegates attended representing industry, employees and unions. It was most successful and is worth following up at a later date.

A project entitled 'Evaluation of Dolerite Sill Overburden on Underground Mining Operations' is being conducted by Australian Coal Industry Research Laboratories Ltd (ACIRL) with National Energy Research Development and Demonstration Council funds at the Duncan and Blackwood collieries of the Cornwall Coal Company. The Department has assisted by diamond drilling monitoring holes and providing a geologist to contribute to the project.

The review of the Department's inspection services was implemented and Mines Inspection and Dangerous Goods were split into two divisions. The review of the Administration Division was completed in August and the recommendations on forming Personnel, Finance, and Resource branches were implemented. A review was conducted into the drilling branch and submitted to the Minister for his consideration.

Legislation was passed to approved the new Groundwater Bill in August, and the Mining Amendment Bill in April.

A new departmental promotion brochure titled 'The Mines and Mineral Resources of Tasmania' was published in July and has been well received by the public. A number of copies have been sent overseas and it is hoped to stimulate interest from international mineral explorers.

Two films on dangerous goods safety were produced with the help of the Tasmanian Film Corporation. They were 'Storage of Flammable Liquids in the Home' and 'Ventilate, don't Asphyxiate' (on the use of open flame appliances), which both address unnecessary dangers due to ignorance and carelessness. It is hoped they will help to reduce the number of needless accidents.

The Engineering Geology Section and the Drilling Branch presented a water bore display at the Bream Creek Show. It is through regular contact with the public that we are able to inform people of the many and varied services provided by the Department. We also exhibited at the Launceston and Hobart Shows and were pleased to win a Certificate of Merit for our display at the Hobart Show. I wish to put on record my appreciation of the voluntary effort put into planning, organising and staffing these Shows by officers of the Department.

The Department received a Certificate of Merit under the 1985 Tasmanian Tidy Towns Competition for Metropolitan Business Gardens which reflects the dedication of Dennis MacArthur, who cares for our building and grounds.

Our final award was a Certificate of Merit from the Commonwealth Department of Resources and Energy as a finalist in the Energy Management Award. This was achieved through the effort of Peter Allan, who manages our energy consumption diligently and effectively.

Boral added an additional 250 tonne gas storage tank at their Devonport LP Gas Terminal providing adequate storage to supply the North-West and West Coast regions. Discussions were held with the University of Tasmania regarding the disposal of chemical waste under the Dangerous Goods Act. The Department has made a commitment to provide disposal facilities.

Exploration expenditure was down for the year, reflecting the general downturn; however several new companies were active, providing an encouraging trend. Precious metal and non-metallic minerals are becoming preferred targets.

The Geological Survey held its annual public seminar in October which was well attended, with seventy-eight participants. A number of important site foundation investigations were carried out, mainly for the International Hotel, the submarine construction site and the Craigbourne Dam.

The Departmental Consultative Committee was formed in March and has met at monthly intervals since then. Each section of the Department is represented by an elected officer to meet with the Director and Deputy Director. The Committee provides a forum in which staff representatives can develop communication and understanding in accordance with the principles of industrial democracy. It is functioning well and enhances our efforts to communicate, co-operate and achieve our objectives.

A new format was approved by the Board of Examiners for the Mine Manager's Certificate of Competency. Candidates will now sit a written examination in mining law in addition to the oral examination previously held. This reflects the Board's belief that mine managers should be well versed in the Mines Inspection Act and Regulations.

The Department continued to express concern at the activities of the Australian Heritage Commission and the possible effect on mineral exploration and development. The State has established firm guidelines for granting exploration licences and mining leases in conservation areas and expects these measures will prove development is not incompatible with conservation. The Commission has listed 34·3 per cent of Tasmania in the last decade and the lack of responsible control over its actions is disturbing. Specifically, we would wish for consultation with State Authorities before listing is finalised. It could be argued that listing should be more exclusive to achieve some regard for its value.

The final meeting of the Mount Cameron Water Race Board took place in December and ended an era going back to 1887 when the Mount Cameron Water Race Act was first proclaimed. Mr B. Farquhar of Scottsdale tendered for the Old Chum Dam and the race system and will utilise the water to irrigate his Rushy Lagoon property.

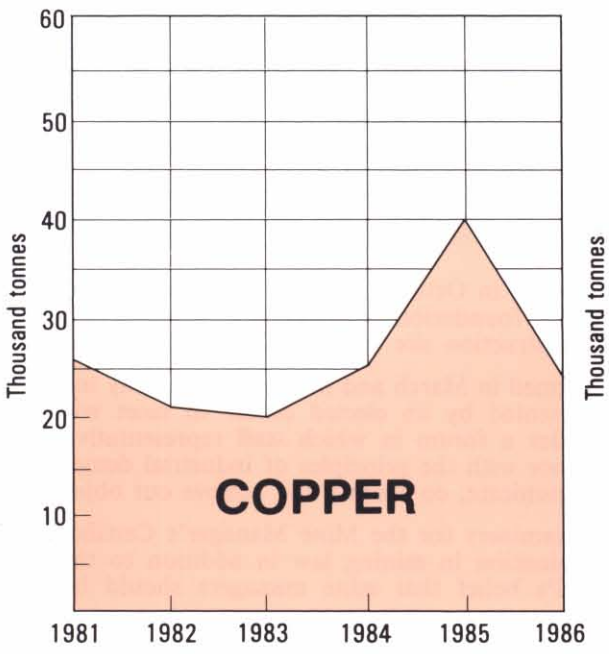
The average number of employees engaged in Tasmania's mining industry was 7 436 in 1985–86.

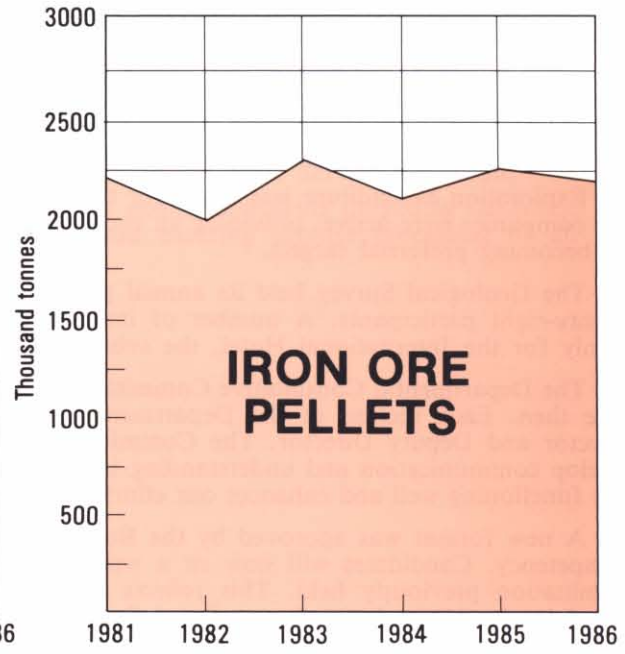
VALUE AND PRODUCTION OF PRINCIPAL MINERALS

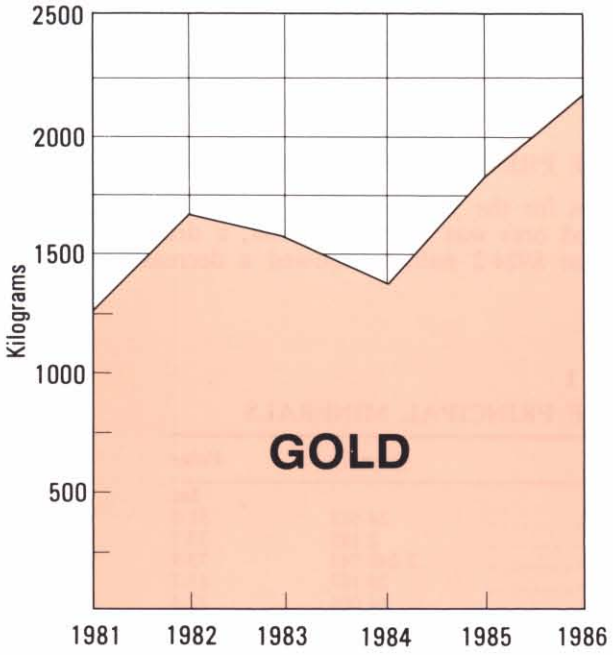
The value of production from Tasmanian sources for the year was $428·75 million, an increase of $6 million on last year. Production from imported ores was $495·46 million, a decrease of $45 million from last year. Total value of production, at $924·2 million, showed a decrease of $38·6 million which was down 4 per cent on last year.

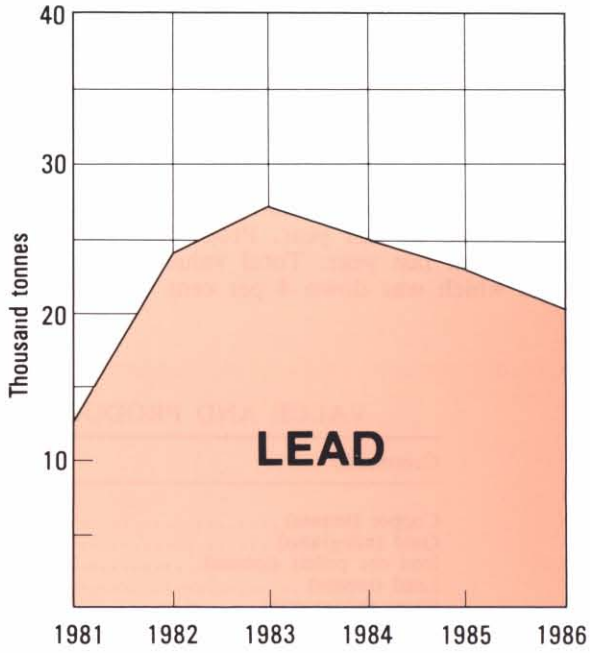
TABLE 1
VALUE AND PRODUCTION OF PRINCIPAL MINERALS

Commodity	*Quantity*	*Value*
		$m
Copper (tonnes)	24 613	51·0
Gold (kilograms)	2 185	33·7
Iron ore pellets (tonnes)	2 240 743	73·9
Lead (tonnes)	20 167	11·7
Silver (kilograms)	84 006	22·4
Tin (tonnes)	4 383	59·4
Tungsten as tungstic oxide (tonnes)	1 439	11·3
Zinc (tonnes)	75 545	85·9
Coal (tonnes)	500 163	14·8

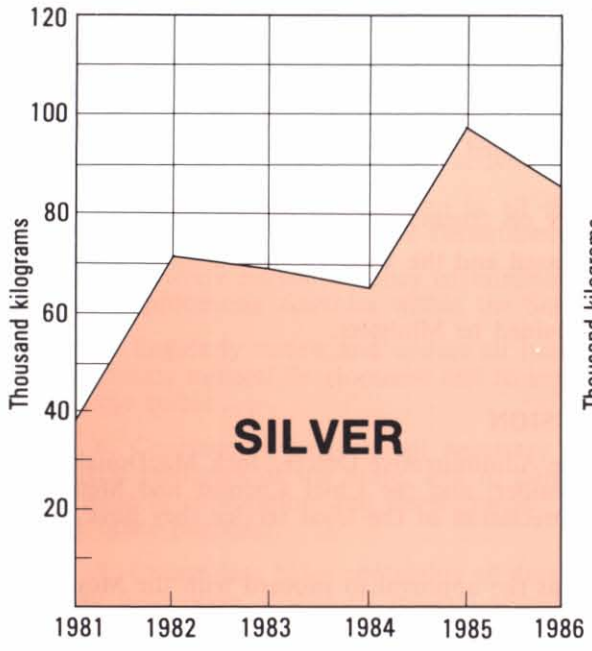

Thousand tonnes
60
50
40
30
20
10
COPPER
1981
1982
1983
1984
1985
1986

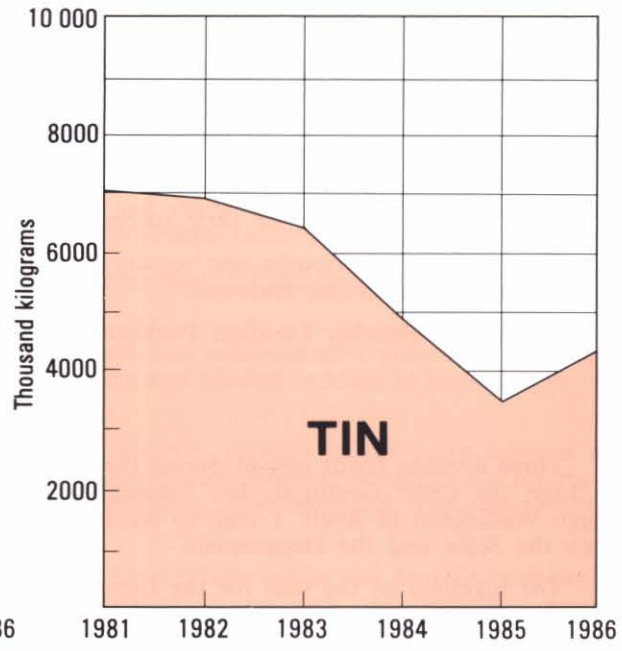

Thousand tonnes
3000
2500
2000
1500
1000
500
IRON ORE
PELLETS
1981
1982
1983
1984
1985
1986

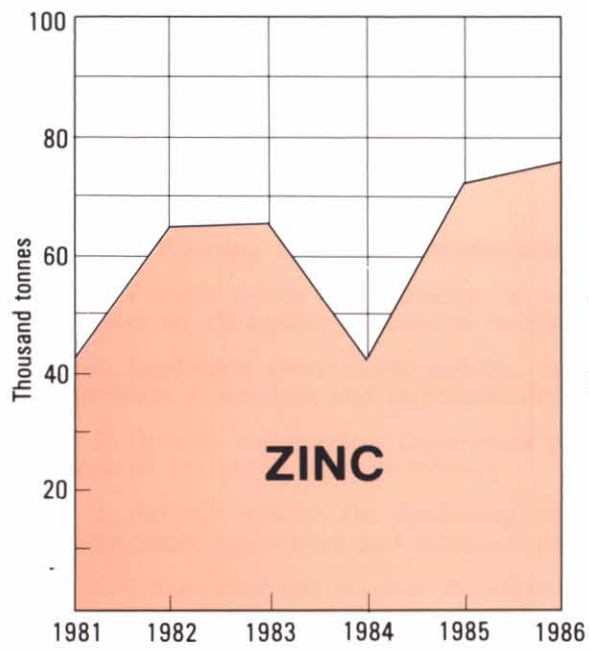

Kilograms
2500
2000
1500
1000
500
GOLD
1981
1982
1983
1984
1985
1986

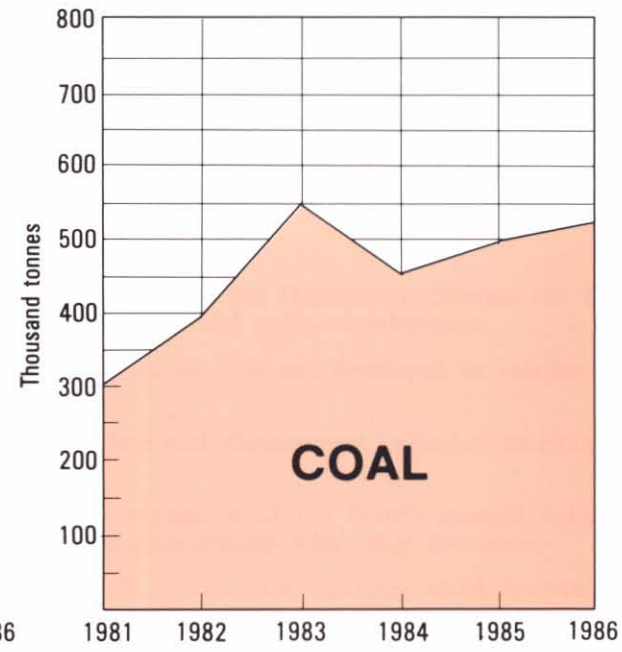

Thousand tonnes
40
30
20
10
LEAD
1981
1982
1983
1984
1985
1986

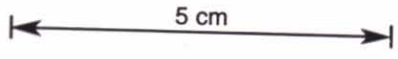
5 cm


120
100
80
60
40
20
Thousand kilograms
SILVER
1981
1982
1983
1984
1985
1986


10 000
8000
6000
4000
2000
Thousand kilograms
TIN
1981
1982
1983
1984
1985
1986


100
80
60
40
20
Thousand tonnes
ZINC
1981
1982
1983
1984
1985
1986


800
700
600
500
400
300
200
100
Thousand tonnes
COAL
1981
1982
1983
1984
1985
1986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AUSTRALIAN MINERALS AND ENERGY COUNCIL (AMEC)

In October 1985 the Council met in Melbourne where the Director of Mines represented the Minister for Mines in his absence.

Offshore Petroleum Legislation including work programme proposals, signature bonus, and retention lease premiums were discussed. Although provision had been made for these measures in the 1985-86 Commonwealth Budget, the States were concerned that they would divert funds away from exploration, and the proposals will now be reviewed. Tasmania agreed to participate in the work of the committee on natural gas.

New Zealand reported on their successful policy on compressed natural gas supplies.

The principle of resource rent royalty was discussed and the Western Australian experience with Barrow Island production reviewed.

The Fringe Benefits Taxation Package was explained to Ministers.

CONCLUSION

Three division heads retired during the year. The Administrative Officer, Jock MacDonald retired in July; the Chief Geologist, Ian Jennings in September; and the Chief Chemist and Metallurgist, Hugh Wellington in April. I wish to record my appreciation of the loyal service they have given to both the State and the Department.

The highlight of the year for the Department was the approval to proceed with the Mount Read Volcanics Project. I must praise the Government and the Minister for Mines for their vision and support in providing the funds for this research to be done. Our mineral resources are finite and with the expected closure of Mount Lyell in 1989, it was necessary to accelerate exploration and ensure the continuance of the mining industry. The Geological Survey responded magnificently and have achieved all the targets set. I believe this to be the most important task ever to be undertaken by the Department since its inception in 1882 and I commend Rod Hargreaves and his team for the results. The project has required an input from everyone in the Department and I wish to express my appreciation for the dedicated service given by all officers of the Department of Mines.

HUGH MURCHIE, Director of Mines.

REPORTS BY DIVISIONS OF THE DEPARTMENT OF MINES

ADMINISTRATION DIVISION

The year 1985–86 saw major changes to the structure of this Division. These were as a result of the review referred to in my last report and the consequential reviews which flowed from it.

A new Divisional Head commenced duty in March. The new Administrative Officer is Mr D. F. Spratt who previously held a similar appointment in the Department of Construction.

A new branch of Resource Administration was created and the new branch head appointed in April 1986. It was still in a settling down phase by year end but when fully operational will streamline and simplify the processing of mineral tenement applications.

The Accounts Section was re-organised into two separate functional areas. The position which was previously entitled Accountant is now the Manager-Finance and this officer will concentrate on the financial management of the Agency. All budgeting and policy matters concerning finance will be handled in this area. The operational accounting function involving payment of creditors and receipt of revenue will be controlled by the Senior Clerk. This new configuration should ensure greater efficiency and effectiveness in a vital area.

The proclamation of the State Service Act was delayed until 1 January 1986. This Act represents a significant change in the administration of government service and should result in administration becoming more efficient and responsive to change.

STAFF MOVEMENTS

Name	*Position*	*Remarks*	*Date*
J. A. P. McDonald	Administrative Officer	Retired	3.7.85
J. C. Collis	Tea Attendant	Retired	6.8.85
S. Ashton	Field Assistant	Resigned	7.8.85
G. S. Cobern	Clerk	Resigned	14.8.85
A. J. Law	Clerk	Promoted	15.8.85
D. Holdernesse	Tea Attendant	Commenced	21.8.85
B. D. Weldon	Geologist	Reclassified	7.9.85
A. I. Vass	Clerk	Resigned	20.9.85
F. H. Webster	Storeman	Resigned	2.10.85
G. R. Humphries	Field Assistant	Resigned	4.10.85
R. H. Findlay	Geologist	Commenced	18.11.85
I. B. Jennings	Chief Geologist	Retired	16.12.85
P. J. Spence	Clerk	Commenced	16.1.86
D. L. Wheeler	Laboratory Technician	Resigned	24.1.86
M. J. Dix	Publications Officer	Reclassified	30.1.86
J. V. Wright	Field Assistant	Commenced	20.2.86
M. J. Davie	Drafting Officer	Commenced	21.2.86
D. F. Spratt	Administrative Officer	Commenced	6.3.86
S. J. Mitchell	Driller	Resigned	14.3.86
H. K. Wellington	Chief Chemist and Metallurgist	Retired	2.4.86
P. H. Winchester	Petroleum Engineer	Commenced	28.4.86
M. W. Pickering	Industrial Chemist	Promoted	1.5.86
R. Bezzant	Office Assistant	Resigned	9.5.86
N. J. Hackett	Laboratory Technician	Commenced	12.5.86
J. G. Hitchcock	Clerk	Promoted	15.5.86
M. D. Dwyer	Executive Officer—Resource Administration	Commenced	15.5.86
P. J. Spence	Clerk	Transferred	28.5.86
L. D. Bourn	Clerk	Commenced	29.5.86
V. Gala	Clerk	Commenced	29.5.86
A. Geddes	Field Assistant	Resigned	26.6.86

EXPLORATION LICENCES

The number of applications received for licences was thirty-seven compared with thirty-one during 1984–85. Twenty-three of the applications were for all minerals, two for coal, and the balance of two for oil.

Applications received during the past four years are as follows:—

1982–83: 64 1984–85: 31

1983–84: 65 1985–86: 37

As at 30 June 1986 there were 138 current Exploration Licences.

Expenditure for the year was $5 258 568 compared with $8 200 132 in 1984–85.

OIL EXPLORATION

TABLE 2

OIL EXPLORATION PERMITS

Title	*Holder*	*Blocks*	*Expiry Date*
T/14P	Amoco Aust. Petroleum Co. and Others		Renewal
T/15P	Weaver Oil and Gas Corp. Aust.		Under
T/16P	Weaver Oil and Gas Corp. Aust.		consideration
T/18P	Amoco Aust. Petroleum Co. and Others	118	22.07.86
T/19P	Bridge Oil Ltd	243	27.3.87
T/22P	Amoco Aust. Petroleum Co. and Others	52	3.9.90

COURT OF MINES

Tasmania is divided into four mining districts. Each district has a Warden of Mines. The Wardens, who are magistrates, hear disputes arising under the *Mining Act 1929*, in the Court of Mines. The Wardens are:—

Mr R. B. Chen, North-Western Mining District;

Mr M. A. Hannon, Central Mining District and South-Western Mining District.

Mr K. N. Dockray, North-Eastern Mining District.

Cases heard during the year consisted of:—

C. I. Clark v J. N. Enraught-Mooney. Application for forfeiture of Mineral leases 38M/77 and 39M/77. The case was dismissed on 30 August 1985.

R. and K. Vizer and V. K. and C. Rada v Northwest Bay Co. Pty Ltd. Objection to Exploration Licence 18/85, 17 sq. km, Farewill Hill. Lease dismissed 16 October 1985.

Wilderness Society v B. G. Harris. Objection to Exploration Licence 23/85, 44 sq. km, Clear Hill. Objection withdrawn 16 September 1985.

Wilderness Society v Shell Co. of Aust. Objection to Exploration Licence 20/85, 87 sq. km, Mt Cleveland. Objection withdrawn 11 October 1985.

Wilderness Society v Metals Exploration Ltd. Objection to Exploration Licence 21/85, 33 sq. km, Heazlewood. Objection withdrawn 1 October 1985.

P. M. Voss v Pioneer Concrete. Objection to lease 34M/85, Inglis River. Application for lease withdrawn 24 October 1985.

Municipality of King Island v Sanidine N. L. Objection to Exploration Licence 28/85. Hearing 31 October 1986.

Calline N. L. v B.H.P. Co. Ltd. Objection to Exploration Licence 12/85, 44 sq. km, Smithton. Hearing 31 October 1986.

RESOURCE PLANNING AND POLICY DEVELOPMENT DIVISION

The Division operates across the spectrum of Departmental activities in co-operation with the other Divisions and thus has a general input to the Department's operations.

The first Corporate Plan was put into place early in the year, as was the initial introduction of Performance Appraisal. At the end of the year the update of the Corporate Plan was almost complete and the annual Performance Appraisal for the first year was proceeding.

Project Budgeting for the Department was slow to start due to staffing, programming and computer availability problems. Overcoming initial difficulties highlighted that over-enthusiasm within the Department was straining our resources and some simplification had to be imposed. The situation now appears to be settling down and the back-log which had developed should be cleared early in the new year.

The Department's Electronic Data Processing (EDP) plan was prepared and submitted for approval.

Legislative matters have concerned the Mining Amendment Bill, the Petroleum (Submerged Lands) Bill, and dealings with the Deregulation Advisory Board.

In its responsibility for Departmental environmental matters the Division has continued to chair the working group on South-West Management Advisory Committee (SMAC) which oversees exploration and mining proposals in conservation areas. In co-operation with the working group, 'Guidelines for Mining' were produced, given Cabinet approval, and published. These guidelines are parallel to those previously produced for exploration.

Division staff continued to carry out periodic inspections of exploration activities in sensitive areas.

The Division has also been active in supplying input to Management Plans, submissions and reviews for such as State Forests; South-West Conservation Area; administration of the Australian Heritage Act; World Heritage Consultative Committee; and Greening Australia's rehabilitation programmes.

The Division has continued to represent Tasmanian interests on the Australian Minerals and Energy Council working group on Natural Gas and Pipelines, and co-operated with the Bureau of Mineral Resources (Canberra) in studying oil-well testing procedures.

An economic study of the State's mineral industry was carried out for the Minister and Cabinet and completed before the end of the year.

Towards the latter part of the year the Division was given the responsibility for planning and carrying out essential remedial measures in the Rossarden and Storys Creek area where slimes and tailings dams were damaged by a freak storm. This remedial work was continuing at the end of the year.

PETROLEUM DIVISION

This is the first annual report of this Division, the staff of which consists of the State Petroleum Engineer and the part-time services of a petroleum geologist. The year was the most intense ever in terms of exploration activity in the offshore waters of the Tasmanian Adjacent Area, but mixed results from the drilling programme and problems caused by the collapse of the world oil price make the future of exploration uncertain, at least in the short to medium term.

Exploration was confined to the Bass Basin and included the drilling of six wells and the acquisition of 5 466 line kilometres of new seismic data. The exploration was carried out by two consortia, headed by Amoco Australia Petroleum Company (T/14P, T/18P, T/22P) and Bridge Oil Limited (T/15P, T/16P, T/19P).

TABLE 3

DETAILS OF WELLS DRILLED

Name	*Permit*	*Depth (RKB)*	*Date Rig Released*	*Tests*	*Status*
Yolla 1	T/14P	3 347 m	11.10.85	Yes	Plugged and Abandoned
Tilana 1	T/14P	3 900 m	25.11.85	Yes	Plugged and Abandoned with shows
Koorkah 1	T/18P	3 149 m	26.12.85	No	Plugged and Abandoned
Chat 1	T/15P	3 104 m	06.02.86	No	Plugged and Abandoned
Seal 1	T/16P	1 670 m	22.02.86	No	Plugged and Abandoned
Pelican 5	T/22P	4 627 m	16.04.86	Yes	Plugged and Abandoned with shows

Tests carried out on three of the wells are the first production tests carried out on wells drilled in Tasmanian waters. The results of the tests were mixed: good flows were recorded on Yolla 1; no formation fluids were obtained from Tilana 1; only one significant flow was obtained from Pelican 5.

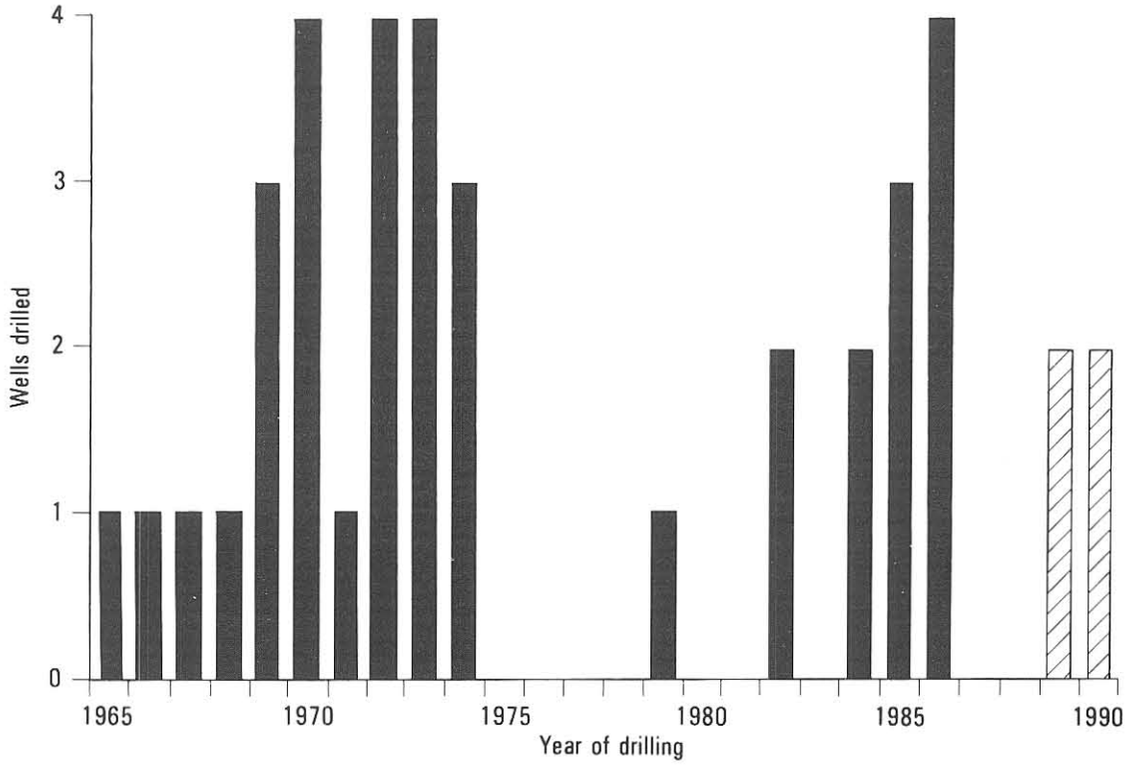
TABLE 4
RESULTS OF MOST SIGNIFICANT TESTS

Well	*Reservoir Interval (m)*	*Choke Size (mm)*	*Gas (m^3/day)*	*Oil (m^3/day)*	*API (degrees)*
Yolla 1	2 818-2 824·5 and 2 809-2 814	11·9	290 000	92	50·3
Yolla 1	1 833·2-1 833·8	6·4	28 000	48	45·5
Yolla 1	1 813-1 833	31·8	335 000	142	50·6
Pelican 5	2 786-2 790	19·0	155 000	70	56 approx.

Prior to the drilling of Pelican 5, high hopes had been held for the future development of the Pelican gas/condensate field, which had been discovered by Esso/BHP in 1970. Production tests on Pelican 5 were disappointing, and its appears that reservoir quality is a major problem.

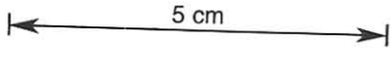
Expenditure for the year was in excess of A$75 million, easily the highest expenditure incurred in exploring the Tasmanian offshore area. The year has shown that hydrocarbons are present in reasonable deliverable quantities in the Bass Basin; it is known that suitable reservoirs exist and also that hydrocarbon-trapping structures are present; it is up to the future to see if all can be found to be present together. The main thrust of the two operators is to study available data so as to predict areas of good reservoir quality before committing themselves to the expense of drilling.

DRILLING ACTIVITY IN TASMANIAN ADMINISTERED WATERS (34 WELLS)



MINES INSPECTION DIVISION

During the year a major structural change took place as the review of the Mines Inspection and Dangerous Goods Branch by Mr N. A. Gilberthorpe, former Chief Executive of Aberfoyle Ltd, was implemented. His recommendations included splitting the Branch into two divisions and devoting more resources to occupational health and safety matters.



As a result the Mines Inspection Division was created, headed by a Chief Mining Engineer with the statutory title of Chief Inspector of Mines. This statutory position was previously held by the Director of Mines.

A small occupational health unit, consisting of two industrial chemists transferred to the division from other branches of the Department, has been established.

The Division is now staffed by six mining engineers, mechanical and electrical engineers, two industrial chemists, a drilling superintendent and twelve drilling crew.

A review of the Drilling Branch was undertaken by Mr G. B. Kremmer, former General Manager of E.Z. Company's West Coast Mines. His report is still under consideration.

MINES INSPECTION BRANCH

General

The Inspection Branch is charged with administration of the *Mines Inspection Act 1968* and attendant regulations. Assistance is supplied to administer the Dangerous Goods Act, the Mining Act, and the Petroleum (Submerged Lands) Act. Some officers of the Branch have also been appointed authorised officers under the Environment Protection Act and the Occupational Safety, Health and Welfare Act to assist the Departments of the Environment and Labour and Industry respectively in administering those Acts as they apply to mines, works and underground operations of the H.E.C.

By regulation and routine and special inspections the Branch ensures that safe and healthy working practices are established and maintained in mines, quarries and metallurgical works. Plans and proposals for operation of mines and equipment are examined and approvals issued as appropriate.

Through the Board of Examiners, certificates of competency are issued to mine managers, crane drivers, winding engine drivers and stationary engine drivers.

During the year a total of 553 field day inspections and special enquiries were carried out and sixty-two certificates of competency issued.

The Branch was represented on the Silicon Development Advisory Committee, which through the Silica Development Act, is supervising establishment of a silicon smelter at Electrona; the Dams Safety Committee; the interdepartmental Occupational Health Committee Working Party; and the Chamber of Mines Occupational Health Committee.

A guide to the Mines Inspection Act was produced to assist mining employees in understanding the legislation and recognising their role in ensuring safe operations of mines. Following on from that guide, work started on revision of the Regulations to bring them up to date and make them more readily understandable.

Legislation was drafted and submitted to the Minister to allow for the election of employees safety representatives in the industry.

Written examinations in legal knowledge were introduced for candidates for mine managers' certificate of competency.

The Branch assisted the Chamber of Mines in organising an occupational health and safety seminar in Burnie for mine managers, employees, safety representatives and union officials. A paper was presented by the Chief Inspector.

Several officers lectured at Trade Union Training Authority and Tasmanian Trades and Labour Council safety courses for union members on legislation and occupational health matters and also attended mine safety committee meetings.

Sampling and testing of mine atmospheres for dust, gases and general ventilation conditions was carried out.

An employee of the Department of Main Roads was successfully prosecuted following an explosives accident which seriously injured a shotfirer.

Complaints were laid against two mine employees from the west coast, but these cases had not been heard by the end of June.

One officer of the Branch attended the Senior Management Development Programme and undertook a three month work assignment in the Division of Public Health. Several officers took part in other shorter management programmes also conducted by the Department of Public Administration.

Safety and Accident Statistics

Accident statistics for the mines and industry are given in Table 5.

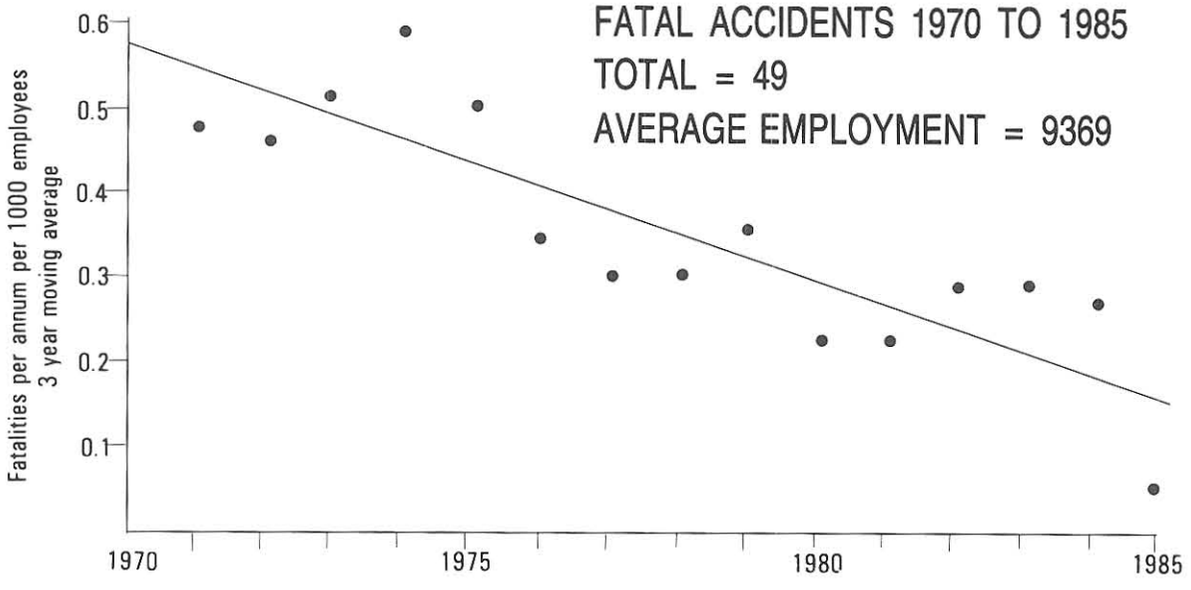
While there was a decrease in the number of people employed in the industry, the number of accidents stayed virtually constant at 1 622 and the number of days lost disappointingly rose from 18 690 in 1984-85 to 23 056 in 1985-86.

Accidents of one to three working days lost accounted for 33 per cent of total accidents, those of four to ten working days 39 per cent, and over ten days 28 per cent.

Underground work continues to be more hazardous with the 14 per cent of mining industry employees who work underground suffering 28 per cent of all accidents.

The number of accidents in the Tasmanian industry is unacceptably high and positive action is required by employers, employees and the Inspectorate to reduce the figures and associated cost in human suffering and dollars.

Although progress in reducing the number of accidents is nil, it is gratifying to be able to report that again, no fatal accidents occurred during the year. The declining trend in mine fatalities over the past fifteen years is shown on the graph.



As in the past, most accidents were of the slipping/falling/manual handling type, which together accounted for 62·5 per cent of the total. The following serious accidents could have been avoided by better working procedures and greater care.

Electrical—electric shock to potline operator when he touched crane hook and furnance step; crane insulation was defective— electrician received burns to face and neck when a spanner slipped on to live busbar; insulating guard had been removed—two electricians were seriously burned when temporary connections in a substation flashed over.

Blasting—an underground supervisor was overcome by blasting fumes when he re-entered his section following a blast—a rise miner was affected by blasting fumes in an unventilated rise.

Falls—open cut foreman fell down face when relocating trailing cable at night—welder fractured leg when he fell through open in platform during construction work—mill operator injured hip when he fell from a ladder—miner fell from loader bucket and fractured his hip when installing roof bolts.

Falling—miner struck by rush of water and rock at a loading station—shift boss suffered spinal injuries when barring down and he was struck by a slab of rock—miner struck by rock fall when working in face on drilling jumbo.

Machinery—a loader operator received deep bruising when his safety lanyard fell under the loader wheel—miner received a crushed foot when caught between a loader bucket and the loader.

Collision—a loco driver received minor injuries when his loco collided with another train; manual block lights had not been used.

Fire—a miner jumped from a burning DJB truck and suffered burns, lacerations and a fractured collar bone.

Major incidents which did not involve injury to persons included:—

- a wharf crane collapsed when the grab caught on the ship's hatchway.
- an old 44 kV circuit breaker exploded when it was clearing a fault exceeding its rating.
- a skip hoist was damaged in free fall after jamming in its tracks.

Drilling Section

Drilling was carried out by six crews operating throughout the State. Performance was highly satisfactory and productivity, expenditure and costs improved over the 1984–85 results.

The Devonport and Lower Midlands groundwater investigation programmes were completed. A start was made on the Sheffield groundwater programme. A water borehole was drilled and equipped as part of a groundwater display at the Bream Creek Show.

Several stratigraphic and mineral investigation holes were drilled on the West Coast as part of the Mount Read Volcanics programme. A multi-hole sub-basalt drilling programme near Waratah commenced.

Landslip investigation holes were drilled and piezometers installed in several locations in the Launceston and Ulverstone areas.

Considerable site investigation work was undertaken on contract to the Materials Research Division of the Department of Main Roads. Contract site investigation drilling was carried out for private industry at Risdon, Boyer and Tonganah. One hole was drilled under contract to the Australian Coal Industry Research Laboratories at the Duncan Colliery at Fingal.

Drilling programmes for the year are summarised as:—

	metres
Site investigation	1 258
Stratigraphic drilling	3 158
Waterboring	4 060
Mineral investigation	804
Landslip investigation	481
Total	9 761

A full drilling summary is given in Table 21.

Prolonged negotiations with the Tasmanian Public Service Association culminated in an award for the drillers being approved by the Tasmanian Industrial Commission. A thirty-eight hour week was approved as were flexible working conditions appropriate to the nature and location of work being undertaken.

The Section's operations were reviewed by Mr G. B. Kremmer, former General Manager of E.Z. Company's West Coast Mines, and his report was submitted to the Minister for Mines in November 1985.

MINING INDUSTRY—MAJOR OPERATIONS

MINES

Aberfoyle Resources Limited, Luina

Towards the end of the financial year, the consolidated lease held by Cleveland Tin Limited was transferred to Aberfoyle Resources Limited.

Tin mining ceased in May and milling ceased in June, when surface stockpiled ore was used up. The remaining underground workforce was retrenched or transferred to other operations.

Tin production for the year exceeded that for 1984–85 by thirty-eight per cent due to a higher headgrade and better mill recovery. Over the eighteen years of its life, the Cleveland mine produced 5·6 million tonnes of ore to yield 24 000 tonnes of tin and 9 800 tonnes of copper.

Following the cessation of the tin operations, mill modifications, initiated in December 1985 to cater for a six-month milling exercise on the refactory Hellyer base-metal ore, were completed. Milling of the Hellyer ore was expected to commence on the 23 July 1986.

Cornwall Coal Company N.L., Fingal

Production at the Duncan Colliery was 287 000 tonnes run of mine coal, a reduction of 23 000 tonnes on the previous year due to adverse mining conditions. Eighty men were employed. The Northern area ceased production in December because of floor heave in the service roads, which will be attended to so that production can restart in 1987. In the south, a two-heading development was started near the southern portals to improve transport of men and materials, coal handling, and ventilation to the south-east headings. The south-east headings advanced 850 m during the year in varying mining conditions. Work commenced by the Australian Coal Industry Research Laboratories to investigate conditions and mining methods, with National Energy Research Development and Demonstration Council funding.

Blackwood Colliery's record production of 202 000 tonnes was achieved with twenty-eight employees and output of 30·78 tonnes per manshift. Workings reached the limit to the north and pillars were extracted whilst retreating. The Wongawilly system was initially used, but this had to be modified because of ground conditions.

Coal washed for the year was 500 000 tonnes which included some 20 000 tonnes purchased from Merrywood. Productivity increased because of operation of the new dense medium addition to the plant. Studies continued to improve recovery of coal from the coarse section of the plant. Sales reached a record level of 339 000 tonnes.

Electrolytic Zinc Company, West Coast Mines

A record 909 146 tonnes of ore were milled during the year. Of this tonnage, 285 090 tonnes were purchased from the Que River mine.

Ore mined at the Rosebery and Hercules mines of West Coast Mines totalled 632 756 tonnes, which also constituted a record.

Concentrate production was:—

	Concentrate	*Zinc*	*Lead*	*Copper*	*Silver*	*Gold*
	tonnes	tonnes	tonnes	tonnes	kg	kg
Copper concentrate	38 468	4 624	11 583	4 335	65 353	1 397
Lead concentrate	35 258	4 453	21 585	194	23 130	109
Zinc concentrate	175 969	90 536	6 282	598	13 682	239

A deep-drilling programme from two sites on Mt Black was completed. The objective, to define the ore body at the south-end to beyond its probable economic limit and the final closing off of the north-end ore lens, was achieved as the result of six intersections in the south and seven intersections in the north.

Net probable ore reserve increases in these areas have been calculated as 1·6 million tonnes.

Golconda Management Ltd, Beaconsfield

This gold tailings retreatment operation commenced in 1985. Tailings are removed from the Middle Arm estuary of the River Tamar by Mudcat Dredge and passed over a trommel. After cycloning, coarse and fines fractions are stored separately in a bin and a thickener. The coarse fraction is milled and joins the fine material in cyanide agitators. Gold is precipitated on to carbon which is then stripped in the elution plant. The gold sludge is removed from the site for further processing.

Tailings treated totalled 275 000 tonnes with 314 kg of gold recovered.

MacKintosh Mining Pty Ltd, Hellyer

Development continued at the Hellyer lead/zinc deposit. In all, 1 484 metres of lateral development and 280 metres of raise boring were accomplished during the year. The ore body was reached and forty-nine metres of this lateral development was in ore, producing 6 700 tonnes of bulk sample. This sample was milled at the Cleveland concentrator on a experimental basis. The raise-bored metreage relates to a ventilation raise, 2·44 metres in diameter, which was eighteen metres short of completion at year end.

During the year, a road was constructed linking the Hellyer access road to the Que River mine. This road was used for haulage of the ore produced at Hellyer.

By category, capital expenditure for the year was as follows:—

	$
Underground development	2 500 000
Facilities and equipment at Hellyer	500 000
Access road, feasibility study and metallurgical testwork	1 650 000
Total	4 650 000

King Island Scheelite, Grassy

Depressed markets and a fall in the price of scheelite resulted in a reduced target for concentrates for the year of 1 363 tonnes (approximately 90 per cent of the 1984–85 production).

From mid-year ore production was concentrated in the high grade zones of the ore body and modifications to the milling circuit resulted in a higher scheelite recovery. Consequently, the target was achieved by milling a considerably lower tonneage of ore (120 377 tonnes) than that milled during the previous year (149 015 tonnes). In order to realise this reduction, operations were closed down for six weeks over the Christmas period and seventeen employees were retrenched in April 1986.

As artificial scheelite proved to be a more saleable product, alterations to the milling circuit were effected to enable approximately 20 per cent of the gravity concentrate recovery to be fed to the artificial scheelite plant. This will increase the production of artificial scheelite from approximately 32 per cent of the total 1984–85 output to 45 per cent.

Mount Lyell Mining and Railway Co., Queenstown

In line with the 1989 closure plan, no major development was carried out. Production and treatment of 1·7 million tonnes of ore was slightly less than 1984–85, but because of better copper grades, production of concentrates was similar. Dollar devaluation resulted in increased output value. A fire in the No. 5 crusher building caused a five-day shutdown and contributed to the ore deficit.

Following successful negotiation of a sales contract with Nissho Iwai and Dowa Mining, both of Japan, work was proceeding at year end to re-establish pyrite production facilities.

In line with the requirements of the Mount Lyell Mining and Railway Company Limited (Continuation of Operations) Act, a number of redundant buildings were removed from the lease during the year and rehabilitation continued.

Capital expenditure for the year was:—

	$
Mining equipment	2 859 000
Vehicle replacement	390 000
Underground ore feeder	195 000
Miscellaneous items	32 000
Total	3 476 000

Que River Mining Pty Ltd, Que River

A total of 274 590 tonnes of lead/zinc ore was hoisted from the mine and 284 100 tonnes of ore were road-hauled to the Rosebery concentrator of the Electrolytic Zinc Company. This higher than previously achieved production reflects an increase in the production rate from 220 000 to 300 000 tonnes per annum from January 1986.

For the first time, mining was carried out in stopes lying between stopes already worked out and filled. In the main, this was successfully undertaken but on 6 June 1986 a collapse of fill in the 7/580 Stope occurred following the firing of production holes in an adjacent stope. Production from the mine was disrupted as the fill material, made fluid by a copious flow of groundwater into the effected area, poured into the 702 F.W. Drive and the Decline. The effect on production was still being experienced at year end.

During the year, six days were lost due to industrial disputes involving the A.W.U. underground employees.

Capital expenditure for the year was:—

	$
Underground works and equipment	2 102 884
Surface works (on lease)	147 713
Power supply and community work	5 297
Total	2 255 894

Renison Limited, Renison Bell

Support for the International Tin Council's buffer-stock manager collapsed in October 1985 and this led, in April 1986, to a 50 per cent drop in the price for the metal. To counter this price drop, Renison decided to reduce operating costs by maximising production. On 21 April 1986, reversion was consequently made to seven days-per-week operating. Total ore treated was 514 340 tonnes, with a tin content of 0·98 per cent.

From 9 July to 29 August 1985, production of concentrates was halted by an industrial dispute involving concentrator A.W.U. members. This dispute began over payments for overtime but developed into an occupational-health issue, involving emissions of hydrogen sulphide, in particular at the leach plant.

At year end, production from both the mine and the concentrator was stable at the new target level of 850 000 tonnes of ore per annum.

Mine development included installation of a second pair of 11 kV feeder cables underground, additional surface exhaust fans, and preparations for a dewatering station in the North Basset area. Mill process control was upgraded with installation of a Fox 300 computer.

Capital expenditure for the year was:—

	$
Community projects	56 718
Lease buildings and services	797 336
Underground equipment	1 546 556
Concentrator plant and equipment	359 587
Instruments, laboratory and workshop equipment	477 800
Office equipment	76 527
Motor vehicles	445 224
Mobile equipment	1 498 126
Mine development	509 257
Shaft development	269 345
Total	6 036 476

Savage River Mines, Savage River

Crude iron ore production was 10 per cent higher than 1984–85, at 5·1 million tonnes, but concentrate production increased by only 2 per cent. Waste rock movement increased by 67 per cent due to the purchase of a fifth P & H shovel, replacement of five haul trucks, and completion of the Main Creek Dam. No production days were lost due to industrial disputes and additional Australian product sales resulted in a planned thirty-eight day shutdown being cancelled. Total tonnage of pellets and concentrates shipped was less than previous years.

Diamond drilling, totalling 2 400 metres, provided better definition of the ore bodies at depth as part of the feasibility study to extend mine life.

Tasmania Mines N.L., Kara

The new Board of the Company instituted a planned expansion programme during the year. Production of scheelite and magnetite increased, with product recoveries reaching 60 per cent. Capital expenditure was $3 million and the new concentrator was 90 per cent complete by year end. Low product prices, between $96 and $66 per m.t.u., severely affected profitability. Lower treatment costs through the new concentrator and sales of magnetite should assist the Company weather the present depressed market.

WORKS

Comalco, Bell Bay

Production was 120 000 tonnes of aluminium blocks, ingots, billets and granules from 240 000 tonnes of imported alumina. The smelter operated at full capacity but with a workforce reduced from 1 285 to 1 123.

Capital expenditure of $3·3 million allowed for automation of No. 2 and 3 potlines and a robot ingot stacker.

Electrolytic Zinc Company, Risdon

Principal production for the year was:—

	tonnes
Zinc	194 974
Cadmium	426
Sulphuric Acid	363 273
Superphosphate	101 146

Zinc production was 990 tonnes lower than the previous year.

Three new alloys were produced in the Casting Division. They were Nickel Alloy ·3 per cent and Nickel Alloy 2 per cent for galvanising, and a new diecasting alloy EZDA-8 with 8 per cent aluminium. A new slim (5 kg) EZDA-3 slab was also produced in the Casting Division for customers in the Far East.

In the Electrolytic Division a total of 5 062 cathodes were stripped in one shift on the Automatic Stripping Machine (this is believed to be a world record for this type of machine). The new mobile Automatic Stripping machine has been operating successfully for the past three months.

The price of zinc was extremely low for most of the year. An Early Retirement package was offered to employees 53 years of age and over and has been well received. Up to the end of June, approximately 200 employees retired under the scheme.

A new granulation plant at the Superphosphate Division was officially commissioned on 4 March and is operating successfully.

A modernisation programme was announced, a feature of which is replacement of the old Leaching Division, dating back to the early 1920's, with new solution purification and neutral leaching sections. The modernisation programme will cost over $80 million, and will take five to seven years to complete.

Goliath Cement, Railton

Cement sales for the year were a record, reflecting national recovery in demand, particularly in the non-residential sector of the building industry.

Capital expenditure was $6·25 million, a major portion of which was for construction of a new clinker handling and blending facility. This will improve environmental aspects of operations, reduce costs and improve quality control. Other capital items were new trucks for the quarry, an automated weighbridge, and a Pyrojet burner for the rotary kiln.

Tasmanian Electro-Metallurgical Co. Pty Ltd, Bell Bay

Production included 64 000 tonnes of ferro manganese, 36 000 tonnes of silico manganese and 19 000 tonnes of ferro silicon. Raw materials were mainly from Groote Eylandt, Whyalla and Newcastle. Local raw materials included woodchips, limestone and quartzite.

Major upgrading, including a new wharf crane, furnace improvements, new casting and crushing facilities, process automation, and an energy recovery unit were approved and were in the process of being constructed. By year end, some $15 million had been spent on these major items.

Tioxide Australia Pty Ltd, Heybridge

A most successful year was achieved with high production and higher product prices. Cost cutting measures included upgraded process control and commissioning of a coal-fired boiler.

The Company reported its lowest number of accidents on record for the year's operation.

DANGEROUS GOODS

DANGEROUS GOODS ACT 1976

The Dangerous Goods Amendment Regulations came into effect during 1985 (Statutory Rule No. 91 of 1985), increasing fees in respect of inspections, permits, applications and licences.

Statutory Rule No. 161 made provision with respect to:

(a) the adoption of the Australian Code for the Transport of Dangerous Goods by Road and Rail;

(b) drivers of vehicles conveying dangerous goods;

(c) packages containing dangerous goods;

(d) shot-firers' permit;

(e) licences;

(f) classes of dangerous goods; and

(g) the use of 'flammable' in place of 'inflammable'.

All imports of Class 1, 2.1, 3.1, 3.2 and 3.3 Dangerous Goods into the State were supervised by Inspectors of the Division.

The number of field inspections covering handling, storage, import, use and sale of dangerous goods was 3 189, compared to a programme budget figure of 3 000 for the year.

Dangerous Goods Class 1 Explosives were destroyed on four occasions.

The Division was actively involved in the preparation of displays presented at both the Launceston and Hobart agricultural shows.

There was a slight reduction in the number of fireworks licenced premises and all retail and wholesale premises were inspected prior to and during the selling period. Fireworks samples as imported were tested for safety, and fireworks safety lectures were given to pupils at sixty-nine primary schools through the State.

Members of the Division served on the following committees:—

Australian Transport Advisory Council's Advisory Committee for the Transport of Dangerous Goods by Road and Rail.

Australian Transport Advisory Council's Competent Authorities Committee.

Standards Association of Australia ME/17 Flammable and Combustible Liquids.

Standards Association of Australia CH/9 Safe Handling and Storage of Chemicals.

The Division was represented on the Building Regulations Board, LP Gas Safety Sub-Committee, Hazardous Material Plan Committee, and the Southern Regional Disaster Planning Group.

Twenty-four incidents involving Dangerous Goods were investigated and are listed according to their class.

Class 2.1 LP Gas

A complaint concerning gas odours at a Hobart city premises was checked; no explosive atmosphere was present and it was concluded that recently disturbed town gas pipework was the source of the odours.

At McCaines Smithton a 3 tonne gas tank developed a vapour leak due to a split developing in the tank excess flow valve. Product was transferred from the tank to a road tanker, the damaged excess flow valve was replaced, and the tank was brought up to pressure and tested. The product was then transferred back from tanker to tank.

A four-tonne capacity LP gas tanker with the vessel free of liquid product, while en route to Bell Bay from Launceston for loading, left the road, careered along the road table drain and finally rolled on to its side. The driver had just negotiated a left hand turn when he said he heard a bang and lost control of the vehicle. Two tyres were found punctured after the accident.

A GCOT flat tray truck conveying twenty-nine 45 kg and five 13·5 kg cylinders en route to Scottsdale from Launceston left the road and rolled down a steep embankment, where it was stopped by trees. There were no gas leaks from the cylinders. The dangerous nature of the corner has been recorded by the Police.

Three separate incidents of vandalism to copper pipework on LP gas systems supplying cooking appliances at Hobart restaurants were investigated. As a result the section now requires that cyclinder installations in built-up areas readily accessible to the public and not under general supervision, should be protected by a fully enclosed and lockable security cage.

The fatality of an adult male at Miena, Great Lake was investigated due to possible involvement of an LP gas refrigerator; however, an autopsy revealed that death was due to natural causes.

A standby cylinder, 45 kg LP gas, located at the rear of premises in an area open to the general public, was turned on by vandals. This incident again highlights the need for security cages for commercial installations. The Gas Corporation has compiled a list of premises in use and are remedying the defect.

An LP gas fuelled taxi was involved in a two-vehicle accident at New Town. The gas system was intact despite the vehicle being extensively damaged. The cylinder isolation valve was turned off by a Tasmania Police officer and neither driver received serious injury.

An investigation of two caravans destroyed by fire at Elizabeth Town disclosed that LP gas cylinders involved were not attached to the vans. Arson was the suspected cause. Fortunately, nobody was injured.

The vapouriser at Sheridan Textiles, Derwent Park, caused a gas leak. It appeared that water had seeped into the pressure control switch through vent holes in the pressure diaphragm cylinder. A short back to earth rendered the pressure switch inoperable, with the consequent temperature rise activating the pressure relief valve on top of the vapouriser.

An LP gas powered vehicle (taxi) was involved in a collision with another vehicle. The LP gas system was not damaged and the cylinder was isolated by the taxi owner. There were no injuries; however, the taxi had to be towed away.

Class 2.1 and 6.1

An explosion occurred in a cyanide mixing tank at the Golconda gold recovery plant. The explosion burst a 1·5 tonne bag feeding 50 per cent calcuim cyanide powder into the tank, spilling approximately one tonne of powder over a radius of four metres. Primary cause of the explosion was loss of force ventilation of the tank airspace due to fan bearing failure, allowing accumulation of acetylene from a component of the powder. Secondary cause of the explosion appeared to be detonation of either acetylene or metal acetylides by rubbing of a misaligned mixer shaft against the tank cover.

Class 2.3 Poison Gas, Class 5.1 Oxidising Agent

A gas leak from a chlorine cylinder at the Education Department swimming centre in Hobart was investigated and it was decided that chlorine gas could not be safely stored at any location within the complex. It was recommended that equipment to permit the use of sodium hypochloride for pool cleansing be installed. Chlorine gas cylinders have been removed from the site.

Class 3.1 Petrol

A Devonport man received minor burns and suffered from smoke inhalation as a result of using a four litre container of petrol to ignite a fire. Flames from the fire flashed back to the container, which exploded and set the loungeroom on fire.

Three small weld failures occurred in a steel-plated storage tank at the Caltex Selfs Point terminal, causing a petrol spill of approximately 20 000 litres into the River Derwent. Product was pumped from the failed tank into an adjoining storage tank. The Marine Board boom was used to contain product and the boomed area was agitated with water cannon on the tug 'TAWE'. The whole area was monitored and restricted to the general public during the incident.

An explosion occurred at an engineering machine shop at Devonport whilst an employee was attempting to cut out rust holes from a 4·5 kL fuel tank. The tank had been steam cleaned but not checked to be gas free. One end of the tank separated and travelled twenty-two metres. The employee suffered serious head injuries and burns.

The Tasmania Fire Service advised that petrol odours were present at the Moonah Bowls premises in Moonah. Explosimeter tests did not reveal an explosive atmosphere. The area was generally checked, without results.

After excavation for the installation of a new underground petrol storage tank, there was leakage of petrol and water from an incorrectly abandoned tank at service station premises at the corner of Wellington and Canning Streets, Launceston. After removing the leaking tank, a further five tanks were found; two were removed and three were abandoned in situ.

Class 3.1 Petrol, 3.4 Distillate

A tank vehicle containing approximately 8·2 tonnes of product went out of control and rolled over an embankment on the Arthur Highway south of Dunalley. It appears that the driver either went to sleep or blacked out momentarily. From accounts on the scene there was minor leakage from the tank pressure vacuum vents and from a gash on the shell of the forward compartment on the upper side of the tank. Recoverable product was pumped to another wagon and heavy towing recovered the vehicle back onto the road and it was towed back to Selfs Point terminal for security that night.

3.4 Diesel Fuel

A road tanker conveying a full load of diesel fuel (29 200 litres) overturned one kilometre south of the Hellyer River due to a loss of stability at the fifth wheel connection, due to misalignment of the fifth wheel turntable caused by a fractured key. Functional failure of pressure vacuum valves caused a cargo loss of 9 600 litres of fuel.

Class 3 Flammable Liquids, 4.3 Flammable Substances, 5.2 Organic Peroxides and Class 8 Corrosives

A leak from a rusted container of sodium derivative which interacted with acid in a plastic container caused a fire in the Alanvale Community College flammable liquid store. The incident highlights the danger of indiscriminate storage with inadequate segregation of various classes of dangerous goods.

Class 5.2 Organic Peroxide

A fatal accident occurred in Devonport involving cumene hydroperoxide. The peroxide was accidentally added to a five litre can containing remnants of a promoter used in the manufacture of fibreglass. Presumably the subsequent reaction proceeded at such a rate that the contents forced the cap off the can and the fumes, ignited by the heat of the reaction, exploded in the cabin of the vehicle. The can itself did not explode.

Class 3, 5, 6 and 8 Laboratory Chemicles

Shelves collapsed in the laboratory chemicals store at St Brendan's Shaw College, Devonport, causing a pile of broken reagent bottles. The debris was cleared and reagents separated for disposal. There was no acid contamination.

Class 8 Corrosives

Inadequately secured 25 litre drums of hydrochloric acid fell from the back of a truck in Westbury Road, Launceston. Several packages split and the acid spilled across the roadway. Traffic was delayed and the attending fire brigade took over an hour to clean up the spillage. The transport company concerned was contacted and attention was drawn to their responsibility in regard to safe stowage of dangerous goods.

GEOLOGICAL SURVEY DIVISION

Continued systematic work by the Division continued this year. A major new endeavour was undertaken with the commencement of the Mount Read Volcanics Project, a Government initiative to accelerate mineral exploration in a highly prospective belt of rocks in western and north-western Tasmania by the provision of basic scientific data and by the development of new exploration techniques applicable to exploration for new ore bodies. Other projects undertaken have included an engineering geological investigation of the foundations for the international hotel in Hobart and input into a study designed to improve safety and productivity in Tasmanian coal mines.

Officers of the Division have responded magnificently to the additional challenges imposed. However a number of issues of concern are the need for the continued viability of the Department's drilling section, the need for a keyboard operator to maintain the several computerised data bases recently developed, a requirement for additional facilities to store core from Departmental and private enterprise exploration drilling, and a need for temporary staff to provide basic information on the engineering properties of soils and rocks. Local government is being approached to employ staff for the latter project.

Dissemination of information to the public and government has continued through publications and lectures, a day-long seminar on the activities of the Division held in October, and display at various agricultural shows as well as the servicing of routine enquiries. Work has continued on contributions to the Bicentennial Volume on the 'Geology and Ore Deposits of Tasmania' and other bicentennial projects.

REGIONAL MAPPING

This Branch, consisting of eleven geologists, continued its programme of systematic mapping of the State for publication at a scale of 1:50 000 and supported the fieldwork by laboratory studies.

Summer Projects

Eight of the eleven geologists in the Branch were actively engaged in field work for the Lyell, Maquarie and Montgomery Projects in West Tasmania. Of the three geologists in Hobart the Palaeontologist reported on all fossils found by the field geologists, another geologist petrologically analysed material collected, and the remaining geologist compiled field work completed during the winter months as well as carrying out day-to-day administrative duties and daily radio communications with field camps.

Field work for the Lyell Project was completed. Results have since been used in Company exploration programmes, and by the H.E.C. to evaluate the soundness of the region for the proposed Lake Burbury, rock material for dams and roads, and conditions existing for the construction of the King Scheme tunnel and the proposed pumping house.

In the Macquarie Project about 60 per cent of the region has now been mapped. Hitherto unknown structural relationships have been determined between Precambrian rocks and the younger Mt Read volcanic correlates and associated rocks. Extensive sampling has been completed of the acid volcanic and ultramafic rocks which elsewhere in the State are associated with mineralisation. Field work for the Montgomery Project started during this summer season and particular attention was given to the Mt Read volcanic correlates and associated rocks. Of interest were the copper occurrences in early basic rocks, which may be in part the original source of notable copper deposits that have accumulated within the Mt Read volcanic rocks.

Winter Projects

Field mapping took place for the Woolnorth and Trowutta Projects in the far north-west of the State, where areas of Cambrian volcanic rocks are being delimited and their relationships to older and younger rock units are being established.

Field investigations of the coal-bearing sequences and tin-associated granites continued in north-east Tasmania on the Ben Lomond, Snow Hill and Alberton Projects. Field work for the St Helens Project was completed.

Other Activities

Preparations were completed for publication of a Geological Survey Bulletin on the Dundas—Mt Lindsay—Mt Youngbuck area, the Eddystone Explanatory Notes, St Marys Explanatory Notes, and the Interlaken, Lyell, and St Helens 1:50 000 map sheets. Compilations of data were made for publication of the Huntley and Interlaken Explanatory Notes.

General petrological/geochemical and palaeontological analyses were made, and systematic descriptions of Permian brachiopods continued. Results of field mapping were evaluated and laboratory work was conducted on the material collected.

The Porter Hill drill hole of 194 m depth successfully proved that the inferred Lower Parmeener stratigraphy of the Kingborough 1:50 000 published map sheet is correct.

ECONOMIC GEOLOGY

Mount Read Volcanics Project

Five geologists of the Branch are involved in the Mount Read Volcanics Project. Three geologists, an analyst, three senior field assistants, five field assistants, and a clerical assistant have also been employed on a temporary basis.

Work in progress includes:—

1. Geological mapping of the upper Henty River-Rosebery-Que River areas has been completed and this work will be presented as three 1:25 000 coloured geological maps and associated reports. Drill holes to investigate geological relationships were completed near Rosebery.

2. Geochemical alteration and oxygen and sulphur isotope studies of the Hellyer, Hercules and Boco Siding areas are in progress. The aims of this work are to determine the extent and nature of alteration haloes around massive sulphide deposits and to differentiate between haloes around ore bodies and those associated with barren pyritic deposits.

3. *Mineral Deposit Maps*—A series of four 1:50 000 scale mineral deposit maps is in preparation.

4. *Geochemistry*—Water and soil samples have been collected from the Mount Read Volcanic belt from Elliott Bay to Hellyer with the aim of developing new, cheaper methods for geochemical exploration by the analysis of metal contents in the organic fraction of these samples.

5. *Remote Sensing*—Data from the geological mapping, mineral deposit mapping and geophysical projects, together with satellite images and aerial photographs, are being used to define areas of high prospectivity by analysis of lineaments observable in the data.

6. *Exploration Data Base*—A complete data base of all mineral exploration carried out in Tasmania is being made available to industry by the microfilming of all exploration reports and by the introduction of a computerised index for the reports.

Commodity Studies

1. *Coal*—The Department contributed geological work and supervision to a National Energy Research, Development and Demonstration Council study, conducted by the Australian Coal Industry Research Laboratories Limited designed to improve mine safety and productivity. The Department provided a diamond drill hole at Fingal Tier at subsidised cost to ACIRL for the installation of extensometers to measure strain. Seventeen unpublished reports for inclusion in a bulletin on Tasmanian coal, and an M.Sc. thesis on Tasmanian coal, were successfully completed.

2. *Industrial Minerals*—Seismic work was performed at the Brambles aggregate quarry near Burnie to define areas for extension of reserves. A number of reports were prepared and public enquiries answered. The bore log data base for closed file reports was completed.

3. *Metallic Minerals*—Work on these projects has been depleted due to commitment to the Mount Read Volcanics Project. Diamond drilling has been carried out to test for gold and tin mineralisation in north-eastern Tasmania. Studies on gold distribution in metallurgical concentrates and ore samples from Mt Lyell, and in rock samples from near Rosebery, Henty River, King River and Lisle, continued. Significant tungsten and copper mineralisation was intersected in a drill hole near Colebrook Hill and zinc mineralisation was intersected south of Zeehan. Two drill holes were completed near Luina to test tin-base metal soil geochemical anomalies.

Hydrocarbons

Monitoring was carried out of five recent offshore exploration wells in Bass Strait and a paper on petroleum exploration in Tasmania was presented. A study on the sedimentary geology of the hydrocarbon-bearing sequence of the Bass Basin was commenced.

Petrology

Petrological examination and mineral identification of samples provided by members of the public and Departmental geologists continued. Studies on metallurgical products from the Kara tungsten mine were carried out. Thirty samples were examined for asbestos, and the development of techniques for the quantitative determination of clay minerals in soil samples continued.

Development of the drill core library and computerised rock cataloguing system continued. Plans are underway to upgrade the X-ray diffraction facility to enable the quantitative mineralogical determination of industrial dusts.

General

Regulation of the mineral exploration industry through the processing and evaluation of 145 company reports and the assessing of applications for new and renewed exploration licences occupied a considerable proportion of the time of the Branch.

A document 'Guidelines for Reporting on Exploration Licences' was prepared and a sunmission for exploration drilling of prospective rock sequences concealed by basalt in the Waratah-Guildford area was prepared for Cabinet. A diamond-drill hole to test a sub-basaltic magnetic anomaly was completed near Waratah. The Cleveland Mine was visited prior to closure to ensure the safe storage of reports, sections and plans.

ENGINEERING GEOLOGY AND GROUNDWATER

Groundwater

Groundwater matters continued to involve the Branch for a large proportion of its time. Sites for salmon hatcheries have been investigated and groundwater occurrences in coastal sand deposits have been investigated at Richardsons Beach, Woolnorth, the Dodges Ferry-Carlton area, Arthur River and Scamander. Numerous property owners have sought advice on groundwater prospects in other areas.

Investigation drilling, pump testing and water sampling of underground water supplies in the lower Midlands has continued. Bores yielding small irrigation supplies of good quality water have been drilled, although pump tests have only been conducted over periods of a few hours. Similar investigations commenced in the Sheffield area in the latter part of the year. Compilation of major, recently completed surveys of groundwater occurrences in the North-East and East Coast regions has commenced.

Monitoring of groundwater levels in the East Devonport-Port Sorell-Sassafras area has been extended to include the Barrington-West Kentish area. Water level measuring devices were installed at Northdown and a continuous water level recorder was placed in a bore at Wesley Vale as part of this survey.

A start has been made to put water bore information on a computer data base. Compilations were made of goundwater information for input on a national register of water resources. Preparation of the Tasmanian part of a hydro-geological map of Australia on a scale of 1:5 000 000 was undertaken.

A number of continuous water-level recording instruments were purchased to obtain background information on natural recharge and dissipation of groundwater.

The Groundwater Bill 1985 was passed by Parliament during the year. This replaces the 1966 Act and aims at the administration of groundwater use and collection of groundwater data. It provides for the establishment of a Groundwater Advisory Committee and a Tribunal to resolve disputes.

Land stability, expansive soils, soil properties

A large number of inspections involving expansive soil and the stability of individual lots and subdivisions have been made. A detailed survey of the Windermere area on the East Tamar has involved detailed mapping, auger drilling and surveying. Part of the area has been zoned in preparation for proclamation as a landslip area.

An investigation of a landslide near the shoreline at Rokeby has resulted in the drilling of horizontal holes for drainage to prevent collapse of a house.

Planning for the Anzslide Conference, an international conference on landslides to be held in Australia and New Zealand in 1987, is well advanced.

A special project officer studying the morphology of Tasmanian landslides has continued his work. Substantial progress has been made and the project is in the early stages of compilation.

A survey of soil properties in the Hobart region began during the year. It is hoped to begin surveys of major urban areas throughout the State in the coming year, to be funded on a co-operative basis between local government and the Department.

Foundation Investigations

Foundation conditions of a number of structures have been examined. Several months were spent on foundations of the international hotel in Hobart and reports completed.

A seismic survey was undertaken at the possible submarine construction site at Margate.

A survey of the Craigbourne Dam site was completed.

Miscellaneous

Possible sites for chemical waste disposal in the Hobart region have been examined. Sites for a new refuse disposal area for the Huon Council have been inspected.

The surveyor has been involved with surveys of landslips, water bores and drill sites for other Branches of the Geological Survey. There has also been considerable involvement with the Mt Read Volcanics Project.

GEOPHYSICS

Mount Read Volcanics Project

In addition to the Senior Geophysicist and Assistant Geophysicist, four temporary field assistants are employed on the project.

Aeromagnetics

Existing data from Western Tasmania (Mines Department 1982) and North-western Tasmania (B.M.R. 1984) is being interpreted and reprocessed to remove terrain effects. The report on the Western Tasmania area is available.

New aeromagnetic and radiometric data covering the areas south of Macquarie Harbour and south of Devonport has been acquired and is available. A report on the south-western area is available and work is proceeding on a report for central-northern Tasmania.

Gravity

A gravity coverage over the Mt Read Volcanics between Elliott Bay and Black Bluff has been largely completed. Detailed surveys over Mt Lyell have commenced. By combining this new data with the existing Tasmanian gravity data-base, a Bouguer gravity map covering the Mt Read Volcanics and adjacent areas has been prepared.

Physical Properties

Measurements of density, magnetic susceptibility, resistivity, sonic velocity and chargeability have been made from core held by the Electrolytic Zinc Company, Renison Limited, and the Department and are continuing. Approximately 160 bulk samples have been taken from the general area of the Mt Read Volcanics for physical property and chemical testing.

Signature Studies

Field work in this project is continuing and involves the use of different techniques over known mineral occurrences and in areas of specific geological problems.

Routine Activities

Data from the detailed B.M.R. aeromagnetic survey of north-west Tasmania has been received and the B.M.R. completed flying the regional coverage of the State in early 1986.

The follow-up gravity survey of the Hellyer deposit showed better definition of the ore zones. Field work in the Zeehan survey was completed.

Routine borehole logging continued with one field assistant being trained in use of the logger.

The capacity of the mini-computer was increased to cope with the load of the aeromagnetic data re-processing. Use of the mini-computer has increased sharply following commissioning of the terminal wiring network around the Rosny Park building.

CHEMICAL AND METALLURGICAL DIVISION

The number of samples registered was 2 278. This is an increase of 52 per cent over the previous year.

The total number of determination done was 20 204 and this is an increase of 30 per cent over the previous year.

The number of whole rock analyses completed was 235, an increase of 18 per cent over the previous year.

Again this year, bismuth, potassium and sodium were determined in record numbers, and tin was again at a comparatively low number at 387. The type of sample that was received can be classified as follows:—

	Number	*Per cent Increase over last year*
Industrial liquors	65	67
Metal or alloy	33	22
Metallurgical Products	366	18
Rock or Mineral	661	25
Waters	851	38
Total	1 976	

The type of analytical method used has been recorded and detail are as follows:—

	Number	*Per cent Increase over last year*
Atomic absorption (AAS)	3 766	9
X-Ray fluorescence (XRF)	10 044	54
Fire assay	459	59
Miscellaneous	5 342	13
Total	19 611	

On the metallurgical side the number of metallurgical operations was 593, which is an increase of 5 per cent.

TYPE AND NUMBER OF TESTS

The following table shows the test work reported as in previous years so that a comparison can be drawn with past reports.

Quantitative—	
Elements	16 441
Miscellaneous	397
Waters	2 671
Industrial Liquors	67
Total	19 576
Qualitative—	
Examination	35
Metallurgical	593
Total	20 204

RESEARCH INVESTIGATIONS

Gold	1
Tungsten/tin/bismuth	1
Tungsten	2
Water	3
Oxidation of mine wastes	1
Barium/tin	1
Thallium	1
Computer programme	1
Total	11

SUMMARY OF INVESTIGATIONS

GOLD

R857—Lisle: Tasmanian Alluvials

A request was made to subject a composite pit sample to hydrocycloning to assess possible plant performance of such a unit.

BARIUM/TIN

R797—King River Delta: Aberdare Incorporated

A heavy mineral concentrate was produced from King River delta sediment with particular regard to the recovery of barytes and cassiterite.

TUNGSTEN/TIN/BISMUTH

R861—Iris Mine, Moina: C.H. Whitehead

A sample of heavy mineral concentrate was submitted to establish a method of separating the valuable constituents, cassiterite, wolframite and bismuthinite.

TUNGSTEN

R842—Department of Mines

A method was developed using glass disc for accurate analysis of tungsten samples with varying matrices over the range of 0–5 per cent WO_3.

R867—Kara: Tasmanian Mines Limited

A sampling survey of the Kara Mill was undertaken to establish the performance of the concentrator just prior to changing to the new concentrator.

WATER

R858—Mt Read Volcanics: Department of Mines

A sampling survey of the streams in the northern section of the Mt Read volcanic zone was undertaken to establish a background against which the effect of future mining activity on streams could be measured.

R864—South Esk River: Department of Mines

The source of pollution in Storys Creek and Aberfoyle Creek is identified and its impact on the South Esk River is discussed.

R866—Impact of West Coast mines: Department of Mines

The impact of the West Coast mines on adjacent streams was studied and discussed.

COMPUTER PROGRAMME

R852—Department of Mines

The automation of the X-ray Fluorescent Spectrometer is detailed, giving the development history, the hardware, the development of the software, and the procedures required for the general operation of the spectrometer and computer systems.

OXIDATION OF MINE WASTES

R680—Department of Mines

The effect of the weathering of mine wastes taken from operating mines throughout the state was observed and reported.

THALLIUM

R868—Department of Mines

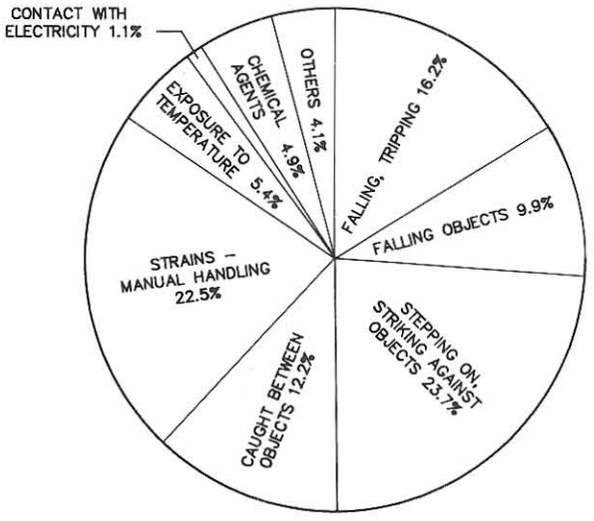
A method was developed for the determination of thallium in mineralised samples.

STATISTICAL TABLES

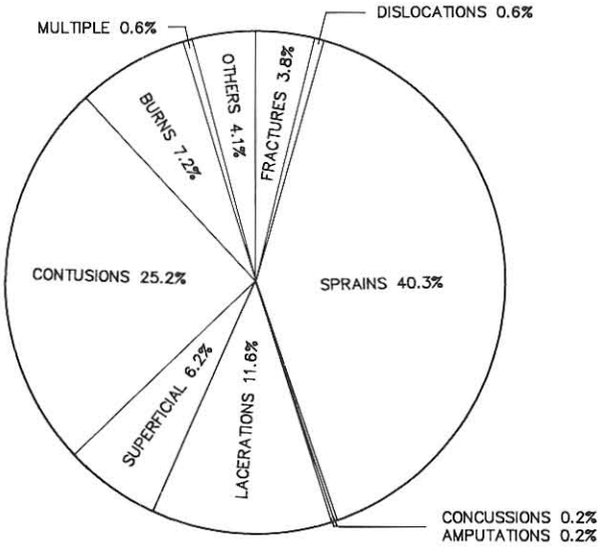
TABLE 5
EMPLOYMENT AND ACCIDENTS 1985–1986 (AS1885)

Employer	*Man Hours Exposure*	*No. of Injuries*	*Frequency Rates*	*Days Lost*	*Incid. Rate*	*Mean Dur.*	*No. of Employees*
					(%)	(days)	
APPM Tonganah	31 113	....	....	....	....	....	20
Cleveland Tin	134 787	12	89	52	20	4·3	60
EZ Rosebery	1 522 808	380	250	5 463	47	14·4	810
Golconda	49 688	11	222	101	57	9·2	19
King Island Scheelite	208 571	4	19	28	4	7·0	108
Mackintosh Mining	32 208	4	124	9	29	2·3	14
Mt Lyell	1 082 582	116	107	1 786	22	15·4	532
Que River	187 359	23	123	397	23	17·3	102
Renison	817 755	123	150	1 579	27	12·8	463
Savage River	908 439	130	143	1 756	29	7·0	443
Tasmania Mines	83 769	6	72	20	15	3·3	34
All Mines	5 059 079	809	160	11 191	31	13·8	2 605
Comalco	2 206 862	222	101	3 796	19	17·1	1 186
EZ Risdon	2 970 132	303	102	4 498	18	14·8	1 651
Goliath Cement	309 887	19	61	187	8	9·8	253
Mole Creek	32 279	2	62	70	11	35·0	18
Port Latta	392 657	20	51	203	10	10·2	193
Temco	890 046	112	126	1 279	26	11·4	433
Tioxide Aust.	773 908	4	5	188	1	47·0	416
Ceramics	224 042	56	250	338	48	6·0	117
All works	7 799 813	738	95	10 559	17	14·3	4 267
Collieries	289 597	54	186	829	37	15·4	147
Quarries	212 043	5	24	257	5	51·4	103
Petroleum exploration	306 671	16	52	220	7	13·8	92
TOTALS	13 667 203	1 622	118	23 056	22	14·2	7 214

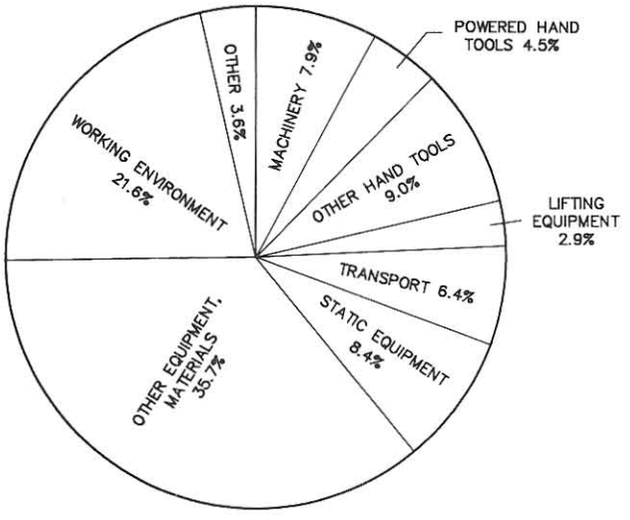
MINE INJURY CLASSIFICATION, 1985–86
(Australian Standard AS1885)



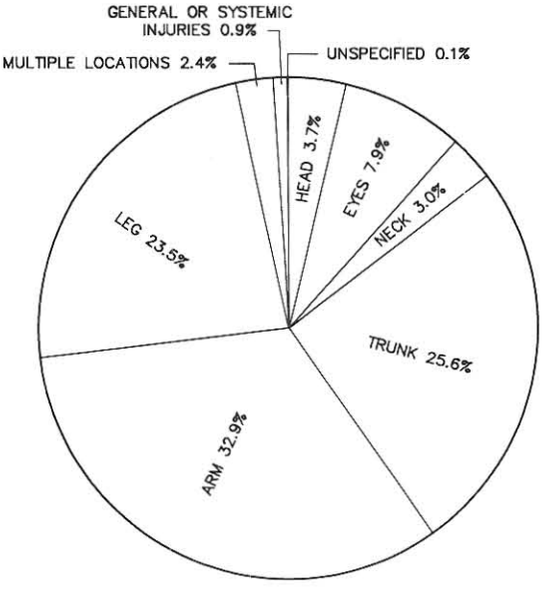
Type of Accident



Nature of Injury



Agency



Part of Body Injured

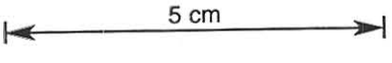


TABLE 6
CERTIFICATES OF COMPETENCY

The following Certificates of Competency were issued by the Board of Examiners in accordance with the *Mines Inspection Act 1968*:—

Metalliferous Mine Manager's Certificates

Certificate Number	*Name*	*Date*	*Mine*
301/85	Alan Douglas Fudge	6.8.85	King Is. Scheelite
302/85	Manohar Lal Mahajan	6.8.85	Savage River
303/85	Russell St John Clark	16.8.85	Renison
304/85	Graeme Wayne Collins	27.8.85	E.Z. Rosebery
305/85	Nigel Marinus Beeke	14.11.85	Mole Creek
306/86	Keith Edward Faulkner	6.5.86	E.Z. Rosebery

Certificates 301/85 to 305/85 were issued by examination *viva voce*. Certificate 306/86 was issued following a written examination in legal knowledge and examination *viva voce*.

In addition fifty Crane Drivers and six Stationary Engine Drivers Certificates of Competency were issued.

TABLE 7
MINERAL PRODUCTION FOR THE YEAR 1985–1986 FROM TASMANIAN SOURCES

	Cleveland Tin Ltd (1)	*Cornwall Coal Co.*	*E.Z. of Aust.*	*King Is. Scheelite*	*Mt Lyell (2)*	*Que River Mines (1) (3)*	*Renison Ltd (2)*	*Savage Rvr Mines*	*TEMCO*	*Tasmania Mines*	*Small Producers*	*Totals*
Cadmium (tonnes)	....	....	167	....	....	....	....	....	....	....	....	167
Cobalt oxide (tonnes)	....	....	4	....	....	....	....	....	....	....	....	4
Copper (tonnes)	247	....	2 242	....	22 124	....	....	....	....	....	....	24 613
Crocoite	....	....	....	....	....	....	....	....	....	....	Specimens only	....
Gold (kg)	....	....	1 367	....	514	....	....	....	....	....	304 (4)	2 185
Iron ore (tonnes)	....	....	....	....	....	....	....	2 240 743	....	....	....	2 240 743
Lead (tonnes)	....	....	20 167	....	....	....	....	....	....	....	....	20 167
Manganese dioxide (tonnes)	....	....	177	....	....	....	....	....	....	....	....	177
Molybdenum (tonnes)	....	....	....	8	....	....	....	....	....	....	....	8
Silica (tonnes)	....	....	....	....	....	....	....	....	....	....	25 522	25 522
Silicon compounds (tonnes)	....	....	....	....	....	....	....	....	55 539	....	....	55 539
Silver (kg)	....	....	80 617	....	3 252	....	....	....	....	....	137 (4)	84 006
Sulphuric acid (mono tonnes)	....	....	144 267	....	....	....	....	....	....	....	....	144 267
Tin (tonnes)	666	....	....	....	....	....	3 646	....	....	....	737	4 383
Tungsten (tonnes)	....	....	....	1 029	....	....	....	....	....	410	....	1 439
Zinc (tonnes)	....	....	75 545	....	....	....	....	....	....	....	....	75 545
Coal (tonnes)	....	500 163	....	....	....	....	....	....	....	....	....	500 163
Peat (tonnes)	....	....	....	....	....	....	....	....	....	....	180	180
TOTAL MINED (tonnes)	112 953	489 290	904 610	127 855	1 690 772	274 590	514 530	5 111 402	30 810	108 235	....	....

(1) Aberfoyle Ltd, (2) Renison Goldfields, (3) Production breakdown combined with E.Z. Company, (4) Golconda Mines, produced 302 kg of gold and 137 kg of silver from 275 000 tonnes mined.
These figures take stockpile fluctuations into account.

TABLE 8
VALUE OF THE MINERAL INDUSTRY

Commodity	Unit	Year ended 30 June 1985		Year ended 30 June 1986	
		Total Quantity	Value	Total Quantity	Value
METALLIC MINERALS—			$		$
Cadmium	(tonne)	173	629 500	167	634 600
Cobalt oxide	(tonne)	5	122 913	4	104 158
Copper	(tonne)	40 292	45 058 648	24 613	50 981 041
Crocoite	(specimens only)	....	15 383	....	3 357
Gold	(kilogram)	1 842	25 288 568	2 185	33 672 614
Iron ore pellets	(tonne)	2 258 014	69 608 648	2 240 743	73 906 003
Iron oxide	(tonne)	7 645	82 120	....	....
Lead	(tonne)	23 028	12 385 351	20 167	11 691 923
Manganese dioxide	(tonne)	208	38 480	177	32 745
Molybdenum	(tonne)	8	30 099	8	21 281
Silica for silicon alloy	(tonne)	26 305	657 625	25 522	638 050
Silicon as silicon alloys	(tonne)	39 106	18 633 168	55 539	25 277 348
Silver	(kilogram)	97 785	27 819 220	84 006	22 393 480
Sulphur—Sulphuric acid from zinc concentrates	(mono tonne)	140 904	6 289 352	144 267	7 516 044
Tin	(tonne)	3 458	60 307 075	4 383	59 433 613
Tungsten as tungstic oxide	(tonne)	1 430	13 488 201	1 439	11 269 983
Zinc	(tonne)	72 799	92 081 824	75 545	85 940 381
Value of metallic minerals		....	372 536 175	....	383 516 621
NON-METALLIC MINERALS—					
Clay—					
Brick	(metre ^{3})	78 603	396 657	99 959	499 795
Other	(metre ^{3})	38 741	193 705	29 684	148 420
Dolomite	(tonne)	14 766	269 829	15 380	284 995
Kaolin	(tonne)	22 422	2 186 269	26 878	2 894 299
Limestone—					
Agricultural	(tonne)	75 162	694 596	66 660	616 264
Cement	(tonne)	585 093	1 755 279	671 773	1 504 672
Chemical and metallurgical	(tonne)	120 907	1 109 302	123 514	1 242 357
Other	(tonne)	21 250	82 239	29 842	130 512
Pebbles	(tonne)	1 305	81 235	999	100 500
Silica	(tonne)	11 183	64 460	16 087	92 380
Value of non-metallic minerals		....	6 833 571	....	7 514 194
FUEL MINERALS—					
Coal	(tonne)	495 726	12 293 809	500 163	14 775 395
Peat	(tonne)	150	36 947	180	41 200
Value of fuel minerals		....	12 330 756	....	14 816 595
CONSTRUCTION MATERIALS—					
Building stone—					
Freestone	(metre ^{3})	295	23 810	556	8 019
Granite	(metre ^{3})	6 768	41 340	4 040	40 400
Granite (red)	(metre ^{3})	....	....	....	....
Other	(metre ^{3})	63	40 560	2 540	41 940
Crushed and broken stone—					
Basalt	(metre ^{3})	380 238	4 162 414	457 619	6 090 145
Dolerite	(metre ^{3})	1 576 039	16 526 635	487 121	6 108 105
Limestone	(metre ^{3})	20 004	189 379	10 137	174 337
Sandstone	(metre ^{3})	17 784	177 840	28 143	281 430
Other	(metre ^{3})	172 888	1 736 490	213 655	2 143 833
Gravel	(metre ^{3})	909 468	5 330 880	667 997	4 168 346
Sand	(metre ^{3})	218 771	1 382 658	415 148	2 662 734
Other road materials	(metre ^{3})	295 159	1 513 585	235 545	1 181 086
Value of construction materials		....	31 125 591	....	22 900 375
TOTAL VALUE WITH AUSTRALIAN METAL PRICES		....	422 826 093	....	428 747 785
METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES—					
Aluminium Aluminium sulphate Cadmium Calcium carbide Cobalt oxide Ferro-manganese Titanium dioxide Zinc		....	540 029 258	....	495 457 247
VALUE OF MINING AND METALLURGICAL PRODUCTION		....	962 855 351	....	924 205 032
AVERAGE NUMBER OF EMPLOYEES		7 946	....	7 436	....

TABLE 9
PRODUCTION OF INDUSTRIAL MINERALS (tonnes)

Company	Kaolin	Limestone				Iron Oxide	Silica
		Agri-cultural	Cement	Chemical and Metall.	Other		
Ballarat Clay Co. (APPM)	26 878	....	....	....	....	....	....
A. R. Beams	....	28 219	....	23 723	....	....	....
Benders Spreading Services	....	9 793	....	51 522	....	....	....
Goliath Portland Cement	....	23 935	671 773	....	17 377	....	....
Mole Creek Limestone	....	4 713	....	48 244	12 465	....	....
F. R. Lazenby	....	....	....	....	....	....	15 876
Dalcoath Mining Company	....	....	....	....	....	....	....
Small Producers	....	....	....	25	....	....	211
Total	26 878	66 660	671 773	123 514	29 842	....	16 087

TABLE 10
IMPORTED ORES

Company	Product (tonnes)				
	Alumina	Lead-zinc ore	Ilmenite	Manganese ore	Phosphate rock
Comalco (Bell Bay)	240 380	....	....	....	....
E.Z. Company	....	166 379	....	....	88 277
Tioxide Aust.	....	....	60 887	....	....
TEMCO	....	....	....	63 257	....

TABLE 11
PRODUCTION OF CONSTRUCTION MATERIALS 1985–86 (cubic metres)

	Building Stone			*Crushed and Broken Stone*					*Other Road Materials*			
Operator	*Freestone*	*Granite*	*Other*	*Basalt*	*Dolerite*	*Limestone*	*Sandstone*	*Other*		*Gravel*	*Sand*	*Brick Clay*
Assoc. Forest Holdings	....	....	....	6 314	....	....	....	....	....	37 748	....	....
Brambles Holdings	....	....	....	152 403	72 456	8 226	....	....	....	....	31 557	....
BMG Resources	....	....	....	245 580	76 024	....	....	99 596	8 290	....	29 957	....
Forestry Commission	....	....	....	....	....	....	7 800	19 883	33 550	26 554	28 654	....
Hobart Blue Metal Industries	....	....	....	....	213 027	....	....	....	....	....	....	....
C. R. Johnson	....	....	....	....	24 375	....	....	....	....	17 495	355	....
Pioneer Quarries	....	....	....	....	81 508	....	....	....	....	....	....	....
Department of Main Roads	....	....	....	....	....	....	....	67 913	167 332	137 242	....	....
BHP	....	....	....	....	....	....	....	....	....	27 035	....	....
Ulverstone Quarries	....	....	....	....	....	....	....	....	....	6 750	2 266	....
Longford Municipal Council	....	....	....	....	....	....	....	....	....	6 987	....	....
Oatlands Municipal Council	....	....	....	....	13 840	....	....	3 532	....	....	....	....
Besser Tasmania	....	....	....	....	....	....	....	....	....	....	61 081	....
Small Producers	556	4 040	2 540	53 322	5 891	1 911	20 343	22 731	26 373	408 186	261 278	99 959
TOTAL	556	4 040	2 540	457 619	487 121	10 137	28 143	213 655	235 545	667 997	415 148	99 959

TABLE 12

NUMBER AND AREA OF LEASES AND LICENCES APPLIED FOR DURING THE YEAR TO 30 JUNE 1986

Leases and Licences	*Number*	*Area (ha)*	*Sluiceheads*
Clay	1	2	....
Gold	21	1 510	....
Minerals	9	940	....
Sand and gravel	26	412	....
Stone	43	2 170	....
Tin	6	119	....
Easements	1	4	....
Water	2	....	6
	109	5 157	6

TABLE 13

NUMBER AND AREA OF NEW LEASES AND LICENCES ISSUED DURING THE YEAR TO 30 JUNE 1986

Leases and Licences	*Number*	*Area (ha)*	*Sluiceheads*
Coal (peat)	6	2 008	....
Gold	2	9	....
Minerals	3	170	....
Sand and Gravel	12	129	....
Stone	18	589	....
Tin	4	180	....
Water	1	3	....
Osmiridium	1	1	....
	47	3 089	....

TABLE 14

TOTAL NUMBER OF LEASES AND LICENCES IN FORCE ON 30 JUNE 1986

Leases and Licences	*Number*	*Area (ha)*	*Sluiceheads*
Bauxite	5	183	....
Clay	17	327	....
Coal	15	5 766	....
Copper	6	1 294	....
Crocoite	1	4	....
Dolomite	4	126	....
Gemstones	4	67	....
Gold	57	2 723	....
Granite	4	12	....
Iron ore	12	3 528	....
Kaolin	1	340	....
Limestone	10	1 243	....
Marble	1	8	....
Minerals	27	5 885	....
Osmiridium	1	20	....
Peat	2	172	....
Sand and Gravel	143	8 259	....
Silica	10	728	....
Slate	1	84	....
Stone	163	8 720	....
Silver, lead and zinc	16	895	....
Tin	291	14 117	....
Wolfram and tin	7	144	....
Water	74	....	650
Easements	84	1 696	....
	956	56 341	650

TABLE 15

TOTAL NUMBER OF ALL TYPES OF PROSPECTING RIGHTS HELD AS AT 30 JUNE 1986

Mining Tenement	*Number*	*Area*
Exploration Licences	116	11 214 km²
Miners Rights/Water Rights	10	12 ha
Prospectors Licences	34	515 ha
Permits to explore for Petroleum under Petroleum Act 1967	2	295 blocks
Owners Consent	1	3 ha

TABLE 16

LICENCES, PERMITS AND APPROVALS ISSUED FOR THE IMPORT, MANUFACTURE, STORAGE, USE AND SALE OF DANGEROUS GOODS

Licences to Keep Flammable Liquids and Dangerous Goods	2 453*
Licences to Sell Explosives and Safety Cartridges	179
Licences to Sell Fireworks	366
Private Magazine Licences	99
Import Explosives Licences	28
Licences to Convey	18
Licences to Manufacture Dangerous Goods	1
Exemptions Granted	....
Applications for Plans Approved	305
Licence to Manufacture Explosives	6
Gas Suppliers Licence	2
Shotfirer's Permits Issued	84
Landing Permits	23
Import Dangerous Goods	17

* Demands issued at start of 1985–86 were 2 459. There were 94 premises cancelled, 79 new premises, 5 reduced storages, 33 additional storages.

TABLE 17

IMPORTS OF FLAMMABLE LIQUIDS

Product (tonnes)	*Bell Bay*	*Burnie*	*Devonport*	*Hobart*	*Total*
Aviation Gasoline	2 512	....	5 300	14 570	22 382
L.P. Gas	5 160	....	11 742	6 642	23 544
Motor Spirit—					
Unleaded	600	485	1 521	3 188	5 794
Premium	101 881	35 159	80 288	152 679	370 007
Kerosene—					
Aviation—Jet	5 480	....	....	12 801	18 281
Lighting and Power	7 059	....	....	810	7 869
Bitumen Feed Stock	....	....	....	18 871	18 871
A.G.O. and Distillate	39 218	30 816	53 537	59 911	183 482
Heating and Fuel Oil	10 300	1 636	18 806	29 996	60 738
Total tonnes per Port	172 210	68 096	171 194	299 468	710 968
Number of Tanker Ships	27	10	30	32	99

TABLE 18

IMPORTS OF EXPLOSIVES

Product	*Devonport*	*Burnie*	*Currie*	*Wynyard*	*Hobart*	*Smithton*	*Total*
Ammonium nitrate for ANFO (t)	....	3 210	....	....	....	....	3 210
Blasting explosives Class 1.1.D (cartons)	1 624	46 290	192	....	10	....	48 116
Propellants Class 1.1.C (cartons)	....	20	....	186	12	....	218
Detonating fuses Class 1.1.D (cartons)	....	137	....	....	....	....	137
Detonators Class 1.1.B (cartons)	....	3 179	112	....	....	31	3 322
Total Cartons	1 624	49 626	304	186	22	31	51 793
Number of Shipments	3	28	9	2	3	2	47

No imports into Queenstown Airport.

TABLE 19

ACTS ADMINISTERED BY DEPARTMENT OF MINES

Aid to Mining Act 1927
Coastal and Other Waters (Application of State Laws) Act 1982
Dangerous Goods Act 1976
Department of Mines (Investigations) Act 1972
Director of Mines Act 1951
Gas Franchises Act 1973
Iron Ore (Savage River) Agreement Act 1965
Mineral Resources Act 1951
Mines Inspection Act 1968
Mining Acts 1929 and 1958
Mount Cameron Water-Race Act 1926
Mount Read and Rosebery Mines Limited Leases Act 1916
Petroleum (Submerged Lands) Acts 1967, 1982
Ringarooma and Cascade Water System (Agreement) Act 1947
Underground Water Act 1966

TABLE 20

STAFF ESTABLISHMENT AS AT 30 JUNE 1986

Administration	34
Mines Inspection	11
Dangerous Goods	9
Geological Survey	49
Chemical and Metallurgical	12
R.P. and P.D.	6
Diamond Drilling	12
Others	16
Total	149

TABLE 21

DRILLING DETAILS 1985–86

Location	*Purpose*	*Drill*	*No. of Holes*	*Total Depth*
				(m)
DIAMOND/AUGER DRILLING—				
Tonganah APPM	Kaolin investigations	Gemco 210D	5	55·6
Hobart Southern Expressway	Road foundations	Gemco 210D	5	67·8
Dora Point, St Helens	Quarry site	Gemco 210D	6	77·04
Tasman Highway, Branxholm	Road foundations	Gemco 210D	2	24·35
Hadspen By-pass	Road foundations	Gemco 210D	6	53·89
Deloraine By-pass	Road foundations	Gemco 210D	3	30·00
Burnie Expressway	Road foundations	Gemco 210D	2	9·25
Bass Highway, Penguin	Road foundations	Gemco 210D	1	10·50
Mersey General Hospital	Site investigation	Gemco 210D	5	58·85
West Tamar Highway	Road foundations	Gemco 210D	2	25·00
Midland Highway, Constitution Hill	Road foundations	Gemco 210D	4	51·15
Tasman Highway, Eaglehawk Neck	Road foundations	Gemco 210D	3	32·05
Pateena Road Prospect	Road foundations	Gemco 210D	4	42·29
Ulverstone, Groom	Landslip investigation	Gemco 210D	3	121·50
East Devonport, Bovil	Landslip investigation	Gemco 210D	1	41·50
East Devonport, Skipworth	Site investigation	Gemco 210D	1	16·00
Bass Highway, Penguin—Howth	Road foundations	Gemco 210D	7	160·64
Northern General Hospital, Burnie	Site investigation	Gemco 210D	4	34·51
Boyer, ANM	Site investigation	Gemco 210D	6	67·8
Lewisham	Dam site	Gemco 210D	5	20·1
Rokeby, Ambrose	Landslip investigation	Gemco 210D	3	37·2
New Henbury	Alluvial minerals	Gemco 210D	deepening	59·00
East Tamar Highway	Road foundations	Gemco 210D	3	20·13
Bass Highway, Pateena Road Prospect	Road foundations	Gemco 210D	3	23·98
Bass Highway, Penguin—Howth	Road foundations	Gemco 210D	4	79·2
Selbourne	Landslip investigation	Gemco 210A	1	45·4
Batman Bridge	Landslip investigation	Gemco 210A	1	51·00

DRILLING DETAILS 1985-86—*continued*

Location	*Purpose*	*Drill*	*No. of Holes*	*Total Depth*
				(m)
Windermere	Landslip investigation	Gemco 210A	1	53·00
White Hills, Evandale	Landslip investigation	Gemco 210A	1	49·00
New Henbury	Seismic holes, alluvial minerals	Gemco 210A	21	75·00
E.Z. Risdon (Maunsell and Partners)	Site investigation	Gemco 210A	10	52·65
E.Z. Risdon (Aust. Groundwater Consultants)	Site investigation	Gemco 210A	9	111·05
Hobart, University	Site investigation	Gemco 210A	1	9·00
Rokeby, Ambrose	Landslip investigation	F20	4	82·00
	Totals		137	1 747·40
ROTARY/DOWN HOLE HAMMER—				
Sheffield	Groundwater survey	Mayhew 1000	5	418·00
Hobart (Marine Board)	Site investigation	Mayhew 1000	5	70·00
Strahan	Stratigraphic	Warman 1000	1	30·00
Jericho	Midlands groundwater survey	Warman 1000	23	2 875·00
Bream Creek	Groundwater display	Mayhew 1000	1	44·00
Sheffield/Railton	Groundwater survey	Warman 1000	8	474·00
New Henbury	Alluvial mineral investigation	Warman 1000	1	64·00
	Totals		44	3 975·00
DIAMOND DRILLING—				
Rosebery	Stratigraphic investigation	Longyear 38 No. 1	1	166·25
Moriarty	Groundwater observation hole	Longyear 44 No. 2	2	249·00
Arthur Dam, Luina	Mineral investigation	Longyear 38 No. 1	1	296·00
Moores Pimple, Hercules	Stratigraphic investigation	Longyear 38 No. 2	1	415·50
Mathinna	Stratigraphic investigation	Longyear 44 No. 1	2	938·03
Grieve Siding (deepening)	Stratigraphic drilling	Longyear 44 No. 1	1	393·35
Porters Hill, Sandy Bay	Stratigraphic drilling	Longyear 38 No. 2	1	194·00
Jupiter, Williamsford	Stratigraphic drilling	Longyear 38 No. 2	1	263·00
Duncan Colliery	ACIRL Contract	Longyear 44 No. 2	1	301·00
Fingerpost, Waratah	Sub-basalt investigation	Longyear 44 No. 2	1	400·00
Tunnack	Stratigraphic investigation	Longyear 38 No. 2	1	62·00
Hobart, Davey Street Extension	Road foundations	Warman 1000	5	37·83
	Totals		18	3 716·00
CHURN—				
New Henbury	Alluvial minerals	Keystone No. 1	7	1 735·00
Dan Rivulet	Alluvial minerals	Keystone No. 1	12	76·00
E.Z. Risdon (Aust. Groundwater Consultants)	Site investigation	Keystone No. 2	7	73·20
	Totals		26	322·70

TABLE 22

TYPE AND NUMBER OF TESTS, CHEMICAL AND METALLURGICAL DIVISION

I. Quantitative—		
A. Elements:		
Aluminium	209	
Antimony	185	
Arsenic	444	
Barium	189	
Beryllium	33	
Bismuth	225	
Cadmium	560	
Calcium	543	
Carbon	86	
Cerium	239	
Chlorine	336	
Chromium	394	
Cobalt	294	
Copper	734	
Fluorine	467	
Gallium	231	
Gold	463	
Indium	206	
Iron (ferric)	817	
Iron (ferrous)	93	
Lanthanum	239	
Lead	691	
Lithium	6	
Magnesium	557	
Manganese	706	
Mercury	116	
Molybdenum	273	
Neodymium	181	
Nickel	295	
Niobium	240	
Nitrogen	27	
Phosphorus	172	
Platinum	7	
Potassium	405	
Rubidium	240	
Scandium	240	
Selenium	206	
Silicon	140	
Silver	292	
Sodium	484	
Strontium	240	
Sulphur	690	
Tantalum	212	
Thallium	16	
Thorium	231	
Tin	387	
Titanium	250	
Tungsten	498	
Uranium	231	
Vanadium	242	
Yttrium	240	
Zinc	757	
Zirconium	182	
		16 441
B. Miscellaneous:		
Waters		
Conductivity	339	
Dissolved solids	397	
Suspended solids	525	
Turbidity	90	
pH	593	
Alkalinity	131	
Hardness	1	
Permanent hardness	128	

TYPE AND NUMBER OF TESTS, CHEMICAL AND METALLURGICAL DIVISION—*continued*

Temporary hardness	128		
Dissolved oxygen	64		
Carbonate	130		
Bicarbonate	130		
Cyanide	15	2 671	
C. Industrial Liquors:			
Acid acceptance	4		
Acid titration	4		
Cleaner concentration	4		
Deoxidiser	4		
Reaction products	4		
Cyanide	17		
Hydroxide	11		
Carbonate	4		
pH	6		
Suspended solids	9	67	
D. Other:			
Combined water	57		
Moisture	1		
Loss on ignition	22		
Insoluble	1		
Liquid limit	79		
Plastic limit	79		
Plastic Index	79		
Linear shrinkage	79	397	
			19 576
II QUALITATIVE	....	....	35
			19 611
III METALLURGICAL—			
Grit	....	1	
Cycloning	....	2	
Cyclosizing	....	7	
Panning	....	112	
Tabling	....	66	
Density	....	196	
Screening	....	6	
Sizing	....	139	
Heavy liquid separation	....	10	
Magnetic separation	....	26	
Crushing	....	1	
Amalgam distillation	....	1	
Ball mill grinding	....	1	
Flotation	....	5	
Cyanidation	....	3	
Jigging	....	2	
Examination	....	1	
Settling tests	....	14	
Total	....	....	20 204

FINANCIAL STATEMENT

SUMMARY OF EXPENDITURE FOR THE YEAR ENDED 30 JUNE 1986

	1983–84	*1984–85*	*1985–86*
	$'000	$'000	$'000
CONSOLIDATED REVENUE FUND—			
EXPENDITURE BY APPROPRIATION DIVISION 37—			
AGENCY RESOURCE SUMMARY—			
Administration—			
Salaries and payments related to salaries	725	762	762
Departmental expenses	232	280	268
Other expenditure	50	....	....
	1 007	1 042	1 030
Mines Inspection—			
Salaries and payments related to salaries	629	705	718
Departmental expenses	100	147	137
Other expenditure	710	257	252
	1 439	1 109	1 107
Geological Survey—			
Salaries and payments related to salaries	1 355	1 369	1 483
Departmental expenses	367	375	291
Other expenditure	8	8	79
	1 730	1 752	1 853
Chemistry and Metallurgy—			
Salaries and payments related to salaries	357	379	387
Departmental expenses	50	54	42
Other expenditure	....	....	26
	407	433	455
Resource Planning and Policy Development—			
Salaries and payments related to salaries	38	145	205
Departmental expenses	3	32	16
Other expenditure	....	....	....
	41	177	221
Petroleum Exploration—			
Salaries and payments related to salaries	....	....	8
Departmental expenses	....	....	4
Other expenditure	....	....	....
	....	....	12
*Dangerous Goods Inspection**—			
Salaries and payments related to salaries	....	234	200
Departmental expenses	....	37	40
Other expenses	....	29	....
	....	300	240
Total Consolidated Revenue Fund Expenditure	4 624	4 813	4 918
LOAN FUND—			
CAPITAL EXPENDITURE BY APPROPRIATION—			
Agency Resource Summary—			
Administration	27	24	....
Mines Inspection	126	83	32
Geological Survey	113	145	221
Chemistry and Metallurgical	29	45	47
Resource Planning and Policy Development	....	....	....
Total Loan Fund Expenditure	295	297	300
Trust Fund—			
In accordance with the provisions of the *Public Account Act 1957*—			
National Soil Conservation Programme—			
Salaries and payments related to Salaries	....	9	21
Other expenditure	....	1	4
	....	10	25
Deposit Account—			
Deposits refunded	30	43	35
	30	43	35
Community Employment Programme—			
Salaries and payments related to salaries	5	32	27
	5	32	27

FINANCIAL STATEMENT

SUMMARY OF EXPENDITURE FOR THE YEAR ENDED 30 JUNE 1986—*continued*

	1983–84	*1984–85*	*1985–86*
	$'000	$'000	$'000
Gordon River Power Development—Mt Read Volcanics—			
Salaries and payments	....	....	227
Other expenditure	....	....	1 089
	....	....	1 316
Mining Trust Fund—			
Aid to Mining Loans	5	16	....
	5	16	....
Mt Cameron Water Race Suspense Account—			
Salaries and payments	32	19	....
Other Expenditure	1	....	....
	33	19	....
Ringarooma and Cascade Water Suspense Account—			
Interest on loan	2	2	2
	2	2	2
Performance Deposits Account—			
Restoration	....	....	2
	....	....	2
TOTAL TRUST FUND EXPENDITURE	114	122	1 407
TOTAL EXPENDITURE FROM ALL SOURCES	5 033	5 232	6 625

* Previously included with Mines Inspection Division.

SUMMARY OF REVENUE FOR THE YEAR ENDED 30 JUNE 1986

	1983–84	*1984–85*	*1985–86*
	$'000	$'000	$'000
CONSOLIDATED REVENUE FUND—			
Public Works and Services—			
Drill hire	123	116	140
Survey fees	3	3	2
Geological services	12	10	48
	138	129	190
Lease Rentals and Fees—			
Lease Rents under the Mining Act	157	164	161
Fees under Petroleum (Submerged Lands) Act	18	15	50
Sale of maps and publications	14	12	14
Other fees under the Mining Act	339	223	175
	528	414	400
Territorial Revenue—			
Royalty on iron ore pellets	312	318	372
Sale of Government property	2	4	8
Storage of explosives and flammable liquids	50	44	85
Mineral Royalties—			
Metallics	1 751	609	985
Sand and gravel	74	116	150
	2 189	1 091	1 600
Other Sources—			
Miscellaneous	3	5	39
	3	5	39
Total Revenue from Consolidated Revenue Fund	2 858	1 639	2 229
Loan Fund—			
Repayments	4	18	48
Total Revenue from Loan Fund	4	18	48
Trust Fund—			
Deposit Account	63	44	67
	63	44	67
Mining Trust Fund—			
Loan Repayments	22	32	23
	22	32	23
Mt Cameron Water Race Suspense Account—			
Sale of Water	8	1	....
	8	1	....
TOTAL REVENUE FROM TRUST FUNDS	103	95	90
TOTAL REVENUE FROM ALL SOURCES	2 965	1 734	2 367

OBJECTIVES OF THE DEPARTMENT AND THE DIVISIONS

DEPARTMENTAL OBJECTIVES

1. Provide Government and the private sector with all possible assistance and sound professional advice towards maintaining and increasing the value to the State of its resources.

2. Assure the State of the maximum utilisation and conservation of its resources by increasing the level of supervision over the activities of the mineral industry.

3. Seek positive participation in all discussions and decisions involving land use and status or changes to such with other State Departments, State and Federal Government, or their instrumentalities.

4. Actively pursue a policy of minimising any environmental impact by exploration, mining and mineral processing activities within the State.

5. Regularly review and update all internal and external administrative procedures and legislation to facilitate mineral development and to supply effective and efficient services to Government, industry and the public.

6. Continue to perform all necessary scientific research, relating to the earth sciences and the mineral resources of the State, and to publish the information obtained expeditiously for the benefit of mineral exploration and development, land use planning, environmental, groundwater resources and other purposes.

7. Create data bases containing all data available from private sector and departmental exploration along with other studies of mineral resources and geology in the State and make this available to the public.

8. Facilitate and oversee the exploration, development and production of the mineral, gas and petroleum resources within the State and in the offshore areas administered by it.

9. Carry out the Department's statutory responsibilities in a manner in keeping with sound professional practices and responsibility.

10. Bring all mining, quarrying and associated activities within the State under departmental control.

11. Maintain responsible and effective communication with all parties involved in the exploration and development of the State's mineral resources.

12. Actively pursue by education and inspection a real reduction in the incidence of accidents and health hazards in the exploration, mining and mineral processing industries.

13. Regularly review all rents, fees and charges associated with services and statutory requirements.

14. Improve departmental efficiency and effectiveness by continuing to operate a programme of staff development and training.

DIVISIONAL OBJECTIVES

Resource Planning and Policy Development Division

1. Provide advice and initiatives to the Government and the Department through the Director of Mines on all aspects of resource development, planning and policy development.

2. Implement Government policies, as they exist or as they are developed in relation to the Department's functions and responsibilities.

3. Develop and monitor Department policies in line with Government initiatives and the expectations of the public and the industry.

4. Actively support the continuing viability and expansion of the State's mineral industry by private sector exploration and increased processing in co-operation with other Divisions.

5. Co-ordinate and monitor the effectiveness of all departmental activities which involve aspects of resource development.

6. Develop, monitor and modify the Department's corporate plan when required.

7. Further develop and monitor the Department's environmental control of the mineral industry's activities.

8. Introduce relevant management systems to the Department as required and approved by the Director.

9. Act as the Public Relations arm of the Department.

Geological Survey Division

1. Continue the programme of systematic mapping of the State on scales of 1:50 000, 1:250 000, and 1:500 000 and revise and republish existing maps as necessary. The mapping programme will be supported by laboratory studies and the work published promptly.

2. Continually update assessments of the State's mineral resources and complete studies on the genesis and distribution of those resources. Provide advice to the Director of Mines on all aspects of exploration and development of mineral resources, for the Minister, Government, industry and public. Develop and maintain data bases containing all geological information collected during mineral exploration and development.

3. Complete phase one of the Mt Read Volcanics Project involving geological, geochemical, geophysical and data base components by November 1986 and prepare submissions for appropriate projects of 12 to 18 months' duration for phase two.

4. Assist the exploration for and development of, the gas and petroleum resources of the State and surrounding continental shelves by the storage, retrieval and distribution of all data arising from previous oil exploration. Make up-to-date assessments of the coal and oil shale deposits of the State and advise explorers on all geological aspects of the solid fuel resources of the State.

5. Assess the quantity and quality of groundwater available in selected areas of the State. Monitor and regulate the production and pollution of groundwater. Maintain a register containing all geological, chemical and hydrological data concerning each water bore put down in the State.

6. Carry out zone planning in areas subject to landslips, provide advice on geological factors which may effect civil engineering structures, and undertake studies and provide advice on all geological hazards. Examine the geological aspects of environmental matters, disposal of dangerous substances, and soil erosion, and offer constructive advice on these matters.

7. Maintain and improve the current information service which involves the publication of geological maps and reports, library services for unpublished reports and the retrieval of geological information. Maintain reference rock, mineral, fossil, bore core and cuttings collections.

8. Maintain expertise in a wide range of geophysical methods in order to provide geophysical advice and services on petroleum and mineral exploration as well as geological problems, bore logging and engineering geology. Keep abreast of new geophysical techniques and instrumentation. Provide computer services.

9. Provide services such as geochemistry, palaeontology, palynology, mineralogy/petrology and lapidary to support other geological activities. Support the publication programme by means of editorial and cartographic services.

Mines Inspection Division

1. Maintain a high level of safety and occupational health in the mineral industry by the regular and thorough inspection of all mines and works.

2. Advise on and monitor the successful reconditioning of land disturbed by mining operations.

3. Advise on and monitor the exploitation of the State's mineral resources on mining leases.

4. Maintain an efficient drilling service for the Geological Division, other Government instrumentalities and, where required, for the private sector.

5. Administer the Mines Inspection Act and Regulations in a fair and equitable manner.

6. Assist the Dangerous Goods Division with the regulation of dangerous goods on mines and works, and to provide advice to the Dangerous Goods Division where necessary.

Dangerous Goods Division

1. Maintain a high level of safety in the import, manufacture, transport, storage and use of dangerous goods by the regular and thorough inspection of all licensed premises and supervising the discharge of dangerous goods in bulk.

2. Advise the public, industry, commerce and government on matters concerning the safe import, manufacture, transport, storage and use of dangerous goods.

3. Monitor the international and Australian scene for changes in regulations and safe practices.

4. Actively pursue the maintenance and where necessary upgrading the level of knowledge and expertise required by the divisional staff in keeping abreast of new developments in the dangerous goods area.

5. Maintain a site for the disposal of hazardous waste generated by Government agencies.

Metallurgical and Chemical Division

1. Provide the Director of Mines with information and advice on matters of a metallurgical or chemical nature relating to the mining industry, and all matters concerning the operational administration of the laboratory.

2. Provide a metallurgical and analytical service, and information and advice on related matters to other Divisions of the Department, the mining industry and the general public.

3. Endeavour to maintain the turn around time of departmental samples at an average of one and one half months with a maximum of three months.

4. Increase the value of work completed for industry and private individuals to $100 000 by 30 June 1987.

5. Actively pursue a programme of upgrading the level of knowledge and experience of laboratory staff by training and research.

6. Monitor the analyses of samples from rivers and mine effluents for changes from seasonal patterns and compliance with the Environment Protection (Water Pollution) Regulations 1974.

7. Keep records and provide the Director of Mines with statistical information on a monthly basis on determinations made, materials analysed and use of equipment.

8. Ensure that the laboratory buildings and equipment are maintained so that the laboratories are able to operate efficiently.

9. Index articles from journals that are of relevance to the operations of the chemical and metallurgical laboratories.

Petroleum Division

1. Encourage and promote oil and gas exploration within Tasmania and in the offshore waters administered by the State.

2. Ensure the Director of Mines is informed of all matters which could influence the establishment of a petroleum industry in Tasmania.

3. Ensure that legislation and recognised good practices are adhered to during drilling and other activities.

4. Co-operate with BMR Canberra in the drawing up of new Directions and Requirements pertaining to the Petroleum (Submerged Lands) Act.

5. Ensure that impact to the environment caused by petroleum exploration and production activity is minimised.

6. Perform regular reviews, investigations, and research, and keep the Director of Mines and industry informed of the outcome.

7. Process tenders for vacant permit areas.

Administration Division

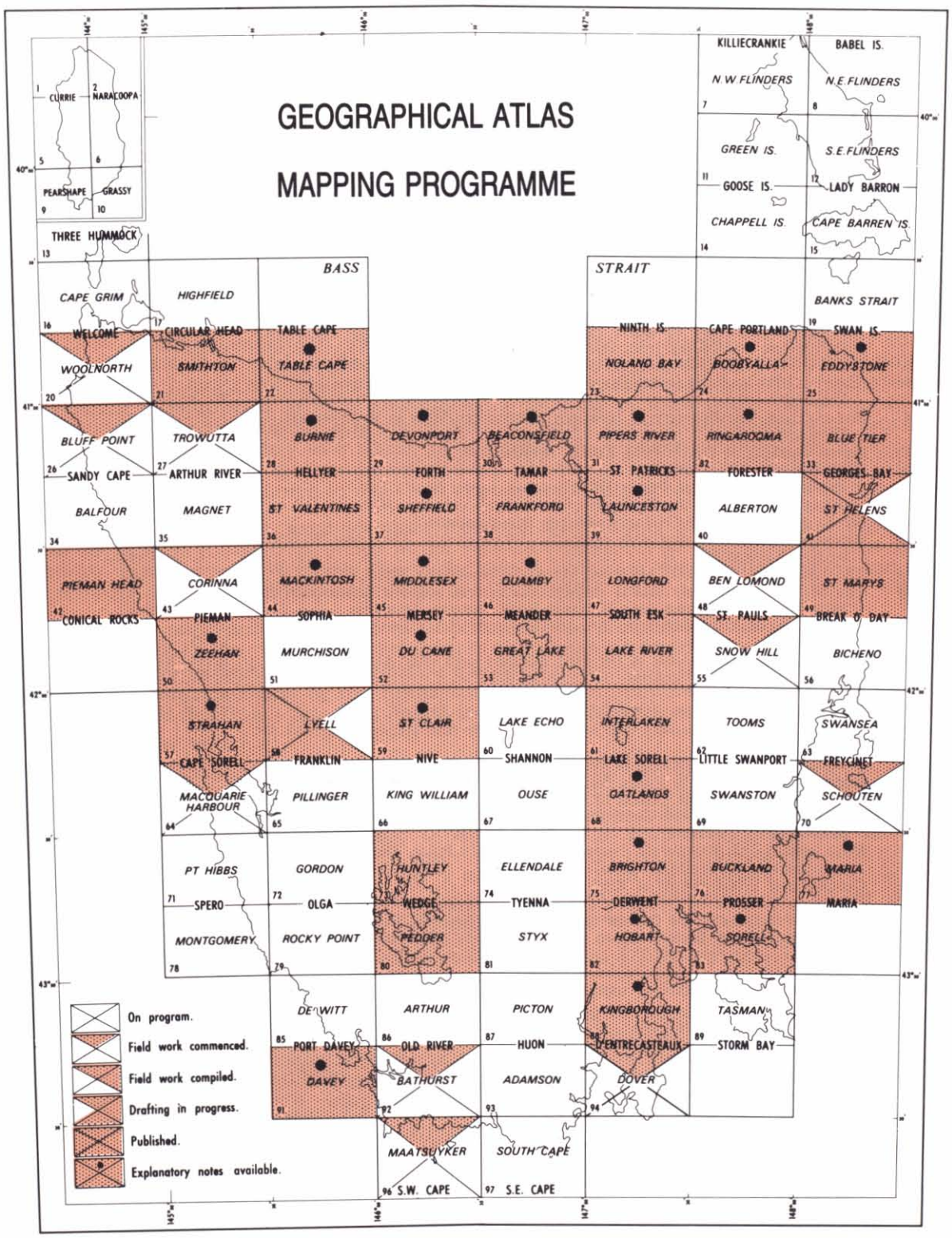
To provide an efficient and effective administrative service for the Director of Mines and the Department by:—

(a) Formulation of the budget including control of expenditure, recording of receipts, provision of management reports and ensuring compliance with Treasury requirements.

(b) Provision of a sound personnel management system, particularly with respect to staff development and training and the requirements of the State Service legislation.

(c) Administration of the legislation for the issue of mining tenements (including offshore), encompassing advice on necessary changes and ensuring prompt processing of all matters.

GEOLOGICAL ATLAS MAPPING PROGRAMME
1:50 000 and 1:63 360 Scales



LIST OF UNPUBLISHED REPORTS 1985–86

No.	*Title*	*Author*	*Date*
1985/24	A diamond drill hole at Little Peppermint Bay, Woodbridge	N. Farmer M. J. Clarke	31.12.85
1985/29	SIE logger casing collar locating tool handbook	J. W. Hudspeth	3.7.85
1985/30	The Bagdad–Kempton coalfield	C. A. Bacon	4.7.85
1985/31	The Langloh (Lawrenny) coalfield	C. A. Bacon	5.7.85
1985/34	CARS—A computer assisted records system (Revision 4)	R. G. Richardson	15.7.85
1985/35	BORIS—A borehole record information system for water bores (Revision 2)	R. G. Richardson	15.7.85
1985/36	FORTRAN programs for the implementation of MIRLOCH (Revision 1)	R. G. Richardson	22.7.85
1985/37	Rare Earth Element patterns of Eocambrian–Cambrian basaltic suites, western Tasmania	H. M. Waldron A. V. Brown	3.9.85
1985/38	The Mersey—Don coalfield	C. A. Bacon	17.9.85
1985/39	Geophysical logging of borehole DOB1, Wesley Vale Basin	J. W. Hudspeth	22.7.85
1985/40	Groundwater in Recent sand deposits at Woolnorth	W. L. Matthews	3.7.85
1985/41	PTCOORD—A FORTRAN program for measuring the co-ordinates of points on a map	R. G. Richardson	22.7.85
1985/42	Contouring using the Department of Mines Perkin-Elmer mini-computer. Part A: Small quantities of raw data (Revision 1)	R. G. Richardson	25.7.85
1985/43	CARP—Computer assisted retrieval of plans (Revision 1)	R. G. Richardson	23.7.85
1985/44	The preparation of text intended for typesetting. How to insert commands in a text file and how to derive magnetic tape output and 'clean' copy with appropriate underlining from this file	E. L. Martin	11.7.85
1985/45	PANTO—A FORTRAN program performing a pantographic drafting function	J. W. Hudspeth	20.8.85
1985/46	Slope stability and site investigation of land at Sophie Place, West Launceston	W. R. Moore	7.8.85
1985/47	The potential for discovery of economic mineral resources in south-western Tasmania	G. R. Green	15.8.85
1985/48	House cracking at Devon Hills Estate, Breadalbane	W. R. Moore	20.8.85
1985/49	Gold analysis–a brief review	W. E. Baker	19.8.85
1985/50	A diamond drill hole at Porter Hill (Grange), Lower Sandy Bay	M. J. Clarke	20.8.85
1985/51	Hardcopy plotting on the Geological Survey mini-computer (Revision 1)	R. G. Richardson	3.9.85
1985/52	Screen graphics on the Geological Survey mini-computer	R. G. Richardson	23.9.85
1985/53	Investigation of the Arthur dam anomalies, Luina Exempt Area, near Waratah, western Tasmania	P. L. F. Collins	....
1985/54	The Leech Hill drill hole, Mt Read Volcanics, Bradshaws Road	K. D. Corbett	27.11.85
1985/55	The Mt Read drill hole (MR1) through the central volcanic sequence–White Spur Formation contact near Howards Road, western Tasmania	K. D. Corbett	28.11.85
1985/56	The Bradshaws Road drill hole through the South Henty Fault Zone, western Tasmania	K. D. Corbett	3.12.85
1985/57	Seismic and gravity surveys in the New Henbury area near Avoca	R. G. Richardson	29.10.85
1985/58	West Coast gravity tie stations	R. G. Richardson M. J. Dix	28.10.85
1985/59	Water table investigation at Heathfield Street, Norwood	W. R. Moore	1.11.85
1985/60	Long/short normal resistivity tool supplement to the field logging handbook for the SIE logger	J. W. Hudspeth	18.11.85
1985/61	Examination of land stability of proposed logging areas, Triabunna district	B. D. Weldon	26.11.85
1985/62	Preliminary report on the Forest No. 1 diamond-drill hole and chemical analysis of associated tholeiitic basalts in the Smithton and Woolnorth Quadrangles	A. V. Brown	12.5.86
1985/63	Geochemical diagrams of Cambrian volcanic rocks and associated intrusives from western Tasmania	M. P. McClenaghan K. D. Corbett	16.12.85
1985/64	Slope stability of Watchorn's Estate at Brickmakers Point, Deviot	W. R. Moore	16.12.85
1985/65	House cracking at Sandown Road, Launceston	W. R. Moore	17.12.85
1985/66	Groundwater investigations at Rheban	D. J. Sloane	24.12.85
1985/67	Report on Government Geologists Conference Workshop on Government Geoscience Programs in the Coastal and Nearshore Zone	D. J. Sloane	19.12.85
1986/01	List of unpublished Reports issued by the Tasmania Department of Mines, 1985	E. L. Martin M. J. Dix	14.2.86
1986/02	Author index to unpublished reports issued by the Tasmania Department of Mines, 1985	E. L. Martin	21.1.86
1986/03	The Adventure Bay Coalfield	C. A. Bacon	13.1.86
1986/04	The Llandaff Coalfield	C. A. Bacon	12.2.86
1986/05	The Longford Coalfield	C. A. Bacon	13.1.86
1986/06	The Mike Howes Marsh coalfield	C. A. Bacon	13.1.86
1986/07	The New Town coalfield	C. A. Bacon	15.1.86
1986/08	The George Town coalfield	C. A. Bacon	22.1.86
1986/09	The Richmond coalfield	C. A. Bacon	22.1.86
1986/10	The Colebrook (Jerusalem) coalfield	C. A. Bacon M. J. Dix	20.2.86
1986/11	Minor coal areas in southern Tasmania	C. A. Bacon	29.1.86
1986/12	The Woodbury coalfield	C. A. Bacon	13.2.86
1986/13	Examination of a development proposal for a former clay pit site, Kings Meadows	B. D. Weldon	8.1.86
1986/14	Groundwater investigations at Richardsons Beach, Coles Bay	D. J. Sloane	8.1.86
1986/15	Seismic refraction survey at the site of a proposed submarine facility, Margate	B. D. Weldon	21.1.86
1986/16	Screen graphics on the Geological survey mini-computer (Revision 1)	R. G. Richardson	4.2.86

LIST OF UNPUBLISHED REPORTS 1985–86—*(continued)*

No.	*Title*	*Author*	*Date*
1986/17	Hardcopy plotting on the Geological Survey mini-computer (Revision 2)	R. G. Richardson	7.2.86
1986/18	Foundation conditions at a proposed flagpole site, Lower Maquarie Street Hobart	D. J. Sloane	16.5.86
1986/19	Brown coal deposits in Tasmania	C. A. Bacon	17.2.86
1986/20	Geophysical logging of the Edgell Cannery borehole	J. W. Hudspeth	4.2.86
1986/21	House cracking at 11 Sandown Road, Launceston	B. D. Weldon	31.1.86
1986/22	The history of coal mining in Tasmania	C. A. Bacon	27.2.86
1986/23	GRVDOC—a FORTRAN program to extract and plot survey locations by identifier	J. W. Hudspeth	2.4.86
1986/24	GRQUAD—a FORTRAN program to plot survey locations on 35 × 35 km quadrangles	J. W. Hudspeth	2.4.86
1986/25	An atlas of Tasmania Department of Mines gravity station locations. Volume 1. Common data base identifier maps	J. W. Hudspeth	27.2.86
1986/26	An atlas of Tasmania Department of Mines gravity station locations. Volume 2. Quadrangle maps	J. W. Hudspeth	28.2.86
1986/27	Offshore well data held by the Tasmania Department of Mines (Revision 2)	P. W. Baillie J. W. Hudspeth	9.4.86
1986/28	Ultramafic—mafic complexes of western Tasmania and Platinum Group Element (PGE) minerals	A. V. Brown	22.4.86
1986/29	Inspection of a gravel pit near Surges Bay	V. M. Threader	29.4.86
1986/30	Geology of the Andrew River—Nelson River area, Lyell Quadrangle	C. R. Calver D. B. Seymour	16.5.86
1986/32	Subsurface investigation of a cracked house at Packham Street, Launceston	W. R. Moore	11.6.86
1986/33	Preliminary site investigation for the Institute of Sports building at Newnham	W. R. Moore	24.6.86
1986/34	Petrography and palaeoenvironments of some Permian coals, Nicholas Range, north-eastern Tasmania	C. A. Bacon C. R. Calver	23.6.86
1986/35	Analysis of coal from the Fenhope Colliery, near Avoca	C. A. Bacon	30.6.86
1986/37	STNDSTN—A FORTRAN program for plotting the distribution of areally sampled data	R. G. Richardson	24.6.86
1986/38	A radiometric age for the Moriarty Basalt, north-western Tasmania	P. W. Baillie	27.6.86
1986/39	Radiometric ages for Circular Head and the Green Hills basalt, north-western Tasmania	P. W. Baillie	27.6.86

REPORT OF THE MOUNT CAMERON WATER RACE BOARD

FOR THE YEAR ENDED 30 JUNE 1986

The Minister for Mines,

We submit the report of the Mount Cameron Water Race Board for the year ended 30 June 1986.

The final meeting of the Board was held on 5 December 1985 when it was agreed to advertise the Board's assets for disposal by tender.

Mr B. Farquhar of Scottsdale purchased the syphons and pipework and intends using the race and the Old Chum Dam to irrigate his Rushy Lagoon property.

H. MURCHIE, *Chairman*

V. WOOD, *Member*

K. R. DAVEY, *Member*

MOUNT CAMERON WATER RACE SUSPENSE ACCOUNT T753

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 30 JUNE 1986

	1985	*1986*
Receipts—	$	$
Appropriation Act 1984–85 (Loss 1983–84)	25 277	....
Appropriation Act 1985–86 (Loss 1984–85)	....	18 073
Other receipts	....	425
Sale of Water—		
Fixed scale	350	....
Royalty scale	....	....
Domestic	496	....
Balance to next account	18 073	....
	44 196	18 498
Payments—		
Balance from last account	25 277	18 073
Salaries wages and pay-roll tax	18 838	....
Travelling allowance	81	86
Refund of Salary Payments	....	339
Balance to next account	44 196	18 498

REPORT OF THE RINGAROOMA AND CASCADE WATER RACE BOARD FOR THE YEAR ENDED 30 JUNE 1986

The Minister for Mines,

The final meeting of the Ringarooma and Cascade Water Race Board was held on 5 December 1985.

Appreciation was recorded for more than thirty years of service on the Board by Mr N. P. Edwards.

The formalities of transferring the assets of the Board to the Rivers and Water Supply Commission are not yet finalised, however they have taken over the Cascade Dam and are constructing the irrigation scheme.

H. MURCHIE, *Chairman*

N. P. EDWARDS, *Member*

K. R. DAVEY, *Member*

RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT T754

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 30 JUNE 1986

	1985	*1986*
Receipts—	$	$
Appropriation Act 1984–1985 (Loss 1983–1984).....	2 132	....
Appropriation Act 1985–1986 (Loss 1984–1985).....	....	2 014
Balance to next account.....	2 014	2 080
	4 146	4 094
Payments—		
Balance from last account.....	2 132	2 014
Interest on Capital Cost	2 014	2 080
	4 146	4 094

A. B. CAUDELL, Government Printer, Tasmania

Department of Mines geologist John Sloane (right) working on foundation investigation at the international hotel site in Hobart.