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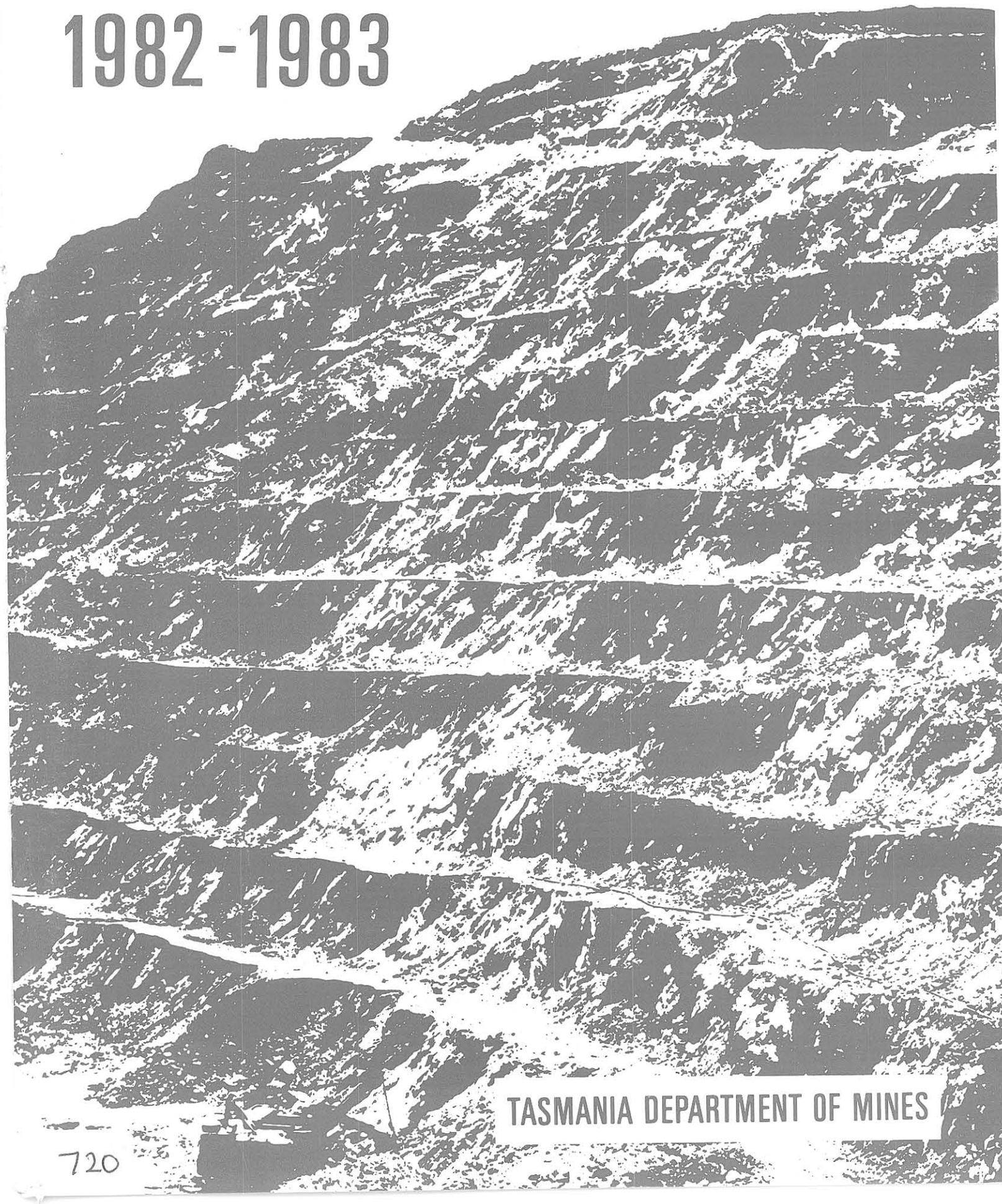
# REPORT OF THE DIRECTOR OF MINES

# 1982-1983



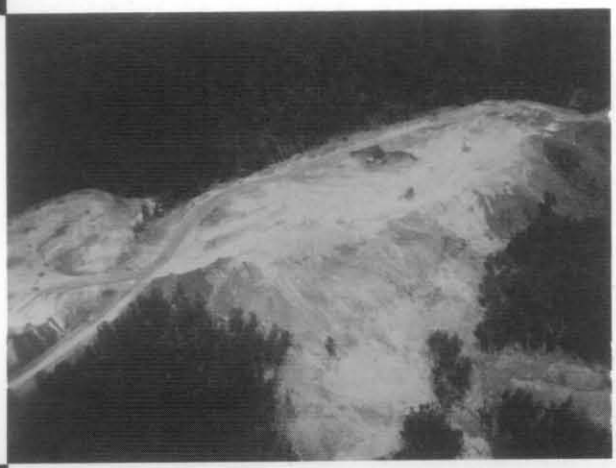
TASMANIA DEPARTMENT OF MINES

720

Northern pit, Leves 3 and 4 ▷

◁ Aerial view of northern pit and dump (bottom) from the north

Aerial view of northern pit and dump (left) ▷



◁ Aerial view of northern pit (bottom left) and central pit (top centre)

SAVAGE RIVER MINES: Development of the northern iron ore deposits will extend the life of this mine. (see pages 7, 8 and 30).

1983 (No. 33)


1983

PARLIAMENT OF TASMANIA

# DIRECTOR OF MINES

## REPORT FOR THE YEAR ENDED 30 JUNE 1983

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

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

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# REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart, 14 November 1983

THE MINISTER FOR MINES

SIR,

I present my report on the mining industry for the year ended 30 June 1983.

The value of metals and minerals produced from Tasmanian ores based on Australian metal prices was $389 million. This represents an increase of four per cent on the figure of $373 million for the corresponding period of 1981–1982.

In addition metallurgical production from ores and concentrates imported into the State was $341 million compared with $343 million for the corresponding period of the previous year. This was a decrease of approximately one half of one per cent.

Production of iron ore pellets, lead, zinc and coal rose while there were falls in the output of tin, copper, gold, silver and tungsten as tungstic oxide.

Major problems confront the mining industry throughout the world. Demand and prices have fallen yet cost factors continue to rise.

The imposition of international tin quotas due to over supply hit Tasmania hard as this is the State's most important mineral in terms of value of production.

These difficulties are clearly reflected in the 10 per cent reduction in employment in the Tasmanian mining industry from 9 422 to 8 425. The situation now appears to be stabilised and the mines are surviving remarkably well. Future employment prospects depend upon scientific mineral exploration, the introduction of tin fuming and smelting and further processing of mineral concentrates in Tasmania.

Details of production and value of all mining products are shown elsewhere in this report but particulars of the principal minerals are summarised below —

| | *1981–1982* | | *1982–1983* | |
|---|---|---|---|---|
| | *Quantity* | *Value $ million* | *Quantity* | *Value $ million* |
| Copper (tonnes) | 20 830 | 30·4 | 19 856 | 34·4 |
| Gold (kilograms) | 1 676 | 18·9 | 1 561 | 23·1 |
| Iron ore pellets (tonnes) | 1 994 263 | 42·3 | 2 294 344 | 57·3 |
| Lead (tonnes) | 23 976 | 15·8 | 27 123 | 16·3 |
| Silver (kilograms) | 71 232 | 16·7 | 68 874 | 24·2 |
| Tin (tonnes) | 6 981 | 98·8 | 6 477 | 97·5 |
| Tungsten as tungstic oxide (tonnes) | 2 465 | 27·8 | 1 533 | 14·5 |
| Zinc (tonnes) | 65 122 | 55·6 | 65 363 | 57·1 |
| Coal (tonnes) | 395 347 | 9·2 | 548 354 | 12·7 |

## DEVELOPMENTS

### RENISON LIMITED

Actions taken in response to International Tin Council quotas on production include a higher grade in the mill feed, reduction in capital expenditure, and a four-week closure of mine operations in December/January. Concentrator operation has been reduced to five days per week. Operating efficiencies including tin recovery have improved significantly.

The investigations into the construction of the Thermal Upgrading Plant have proceeded to the stage where all necessary Government approvals have been given and the project may proceed without delay when circumstances permit.

## MOUNT LYELL MINING AND RAILWAY COMPANY LTD

Copper production at Mt Lyell was maintained by open-cut extraction of a small high-grade section of ore outlined by recent exploration. This helped offset the effects of the mine closure for six weeks in August/September 1982 and a further production stoppage in November due to damage to the main decline. Development was hampered by difficult ground conditions. Installation of major new pumping facilities has commenced.

## KING ISLAND SCHEELITE PTY LTD

Production was considerably reduced because of the continuing glut of tungsten on the world market. Operations were closed down for a month in September and for two weeks at Christmas; production was further reduced by a six-week strike. The mine is currently working at about half its rated capacity and the total workforce has been reduced to 188. Jobs lost in the last twelve months total 144.

## ABERFOYLE LTD — QUE RIVER MINE

Deliveries of ore from Que River to the Electrolytic Zinc Company's concentrator at Rosebery exceeded last year's production. Ore grades achieved in 1982 are being maintained but in subsequent years head grades are forecast to be closer to the ore reserve grade.

Mine exploration in areas of inferred mineralisation has successfully confirmed a high grade block of ore into the indicated category.

## ABERFOYLE LTD — CLEVELAND MINE

The International Tin Council's imposition of quotas on tin production has limited sales to about 60 per cent of production capability. Cleveland mine ceased production for six weeks from mid-December and has continued the grade control measures introduced last year.

Consequently, head grades have been higher than have been achieved for many years. Mine operations have been performing efficiently with good prospects for further development.

Exploration of the Foley tungsten-tin mineralisation has been suspended.

## ABERFOYLE LTD — ZEEHAN

Evaluation of tin mineralisation close to the town boundary continued through the year. Drilling of the three ore bodies, Queen Hill, Severn and Montana has been suspended pending the assessment of preliminary economic studies.

## ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LTD

For the first time in the history of the mine, the work force was reduced at Rosebery. The 124 jobs lost at Rosebery and 214 at Risdon reflect the impact of metal prices. At Rosebery, industrial disputes further reduced output.

Design and construction of plant modifications for Elura Mine concentrates continues at Risdon, together with investigations on improvements in the purification process and modifications to the wharf area for improved materials handling.

## SAVAGE RIVER MINES

Cost saving measures include the conversion of the shaft furnace section of the pellet plant to accept a combination feed of coal and oil. South African anthracite is being used as an extremely low volatile coal which is required to meet pollution control requirements. Tasmanian and mainland coals were unsuitable.

Mining of ore from the northern deposits at Savage River acquired last year will moderate future costs and extend mine life. A production cut of 20 per cent is planned for the April 1983 to March 1984 mining year.

## CORNWALL COAL COMPANY N.L.

The Blackwood mine was officially opened in January 1983. This mine now accounts for one third of total production at a substantially higher production per man, reflecting better mining conditions than those at the older Duncan colliery.

## TASMANIA GOLD MINE

Renison Goldfields Limited has taken over as manager of the mine and will continue exploration and development in joint venture with Amax Iron Ore Corporation and Allstate Exploration N.L. No further work is being carried out in the Hart Shaft other than to maintain the water level.

## STATE OF THE INDUSTRY

Major problems of over-supply on world metal markets and low prices continue to dog the industry. Reduction in demand has led to a cutback in production and increase in stocks. Lay-offs of mine and process workers have continued with a further 997 jobs lost in 1982–83. The industry has however weathered the recession with considerably more resolution than many other resource-based countries and mine operators have taken all possible measures to remain operational during a difficult period.

These steps include transferring employees from production to development work, mining control to increase the head grade of mill feed, greater use of mechanised mining, improved technical efficiencies in metal recovery and monitoring of energy consumption.

This consolidation of the industry means that it is well placed to take advantage of an upturn in the economy.

Key statistics reveal evidence of a slight recovery from the deep recession which hit the industry in 1981–82. Tentative recovery is however subject to the extreme fragility of economic growth overseas, and recoveries in price and demand have not extended to the steel industry. Demand for iron ore pellets and tungsten, whose major usage in in steel manufacture, continues to be weak. Production quotas on tin and smuggling and sale of tin outside the control of the International Tin Council will hinder development of the State's production, both by major producers and small miners.

The future of the mining industry depends on exploration. In spite of the downturn in metal prices, more than $1 000 000 a month has been spent on mineral exploration in the State.

On 24 March 1983 the moratorium on the South-West Conservation Area was lifted and seven applications for exploration licences have been received. All exploration licences in this area will be issued subject to controls imposed by the Conservation Areas Mineral Exploration Working Group, comprised of representatives of the Departments of Mines and Environment, the National Parks and Wildlife Service and the Forestry Commission.

It is hoped that access to other reserves at present exempt from the Mining Act may be granted under similar guidelines.

Sound land use decisions cannot be made without adequate knowledge of the mineral resources and this cannot be obtained without access for exploration.

Of great concern to the State and resources centred industry is the increased Federal intervention in the management of State lands. Both the Heritage Commission which has listed 25 per cent of the State on the Register of the National Estate, and the World Heritage Act dampen exploration activity.

Future development of the State's mining industry depends on —

*(a)* intensive mineral exploration — mines are finite and new ore bodies must be discovered to replace those worked out;

*(b)* the introduction of tin fuming and smelting — this new technology is essential to the development of new tin mines in the Zeehan area;

*(c)* further processing of mineral concentrates — this trend will depend on the availability of competitively priced and dependable energy.

Even in these times the mining industry has maintained its leadership in contribution to the State's income. Given the right economic climate and the prerogative to determine the development of its resources, the importance of the industry in Tasmania's economy can only increase.

## PRODUCTION

### COPPER

The Mount Lyell Mining and Railway Company Ltd at Queenstown is the principal producer but significant quantities come from the lead-zinc ore of the Electrolytic Zinc Company at Rosebery and the tin ore of Cleveland Tin N.L. at Luina.

The Mount Lyell Company milled 1·43 million tonnes of ore to produce 68 446 tonnes of copper concentrate containing 17 844 tonnes of copper, 2 982 kilograms of silver and 405 kilograms of gold. The concentrates are shipped by road, rail and sea through Burnie to Port Kembla and Japan.

Development of the Main Decline towards the horizon of the 40 series stopes continued but was hampered by difficult ground conditions.

Production was adversely affected by two mine shutdowns. The first of these was due to economic conditions and the second due to a closure of the Main Decline.

The Electrolytic Zinc Company produced 1 566 tonnes of copper in concentrates and Cleveland Tin N.L. 446 tonnes.

### IRON ORE

Savage River Mines produced 2·29 million tonnes of pellets at the Port Latta plant from ore mined at Savage River.

Mining of the Northern deposit started in December and by 30 June the ore produced from this area accounted for one third of the concentrating plant feed rate.

### TIN

Total production was 6 477 tonnes of tin metal in 12 815 tonnes of concentrate.

Renison Limited, the major producer, produced 9 991 tonnes of concentrate which contained 5 078 tonnes of tin in concentrates.

Mechanised cut and fill stoping was again the only mining method employed.

Production was curtailed by a four week shutdown in December/January. This was a result of the imposition of tin quotas.

A number of miners were transferred from production to development work. This was also a result of the tin quota system but resulted in an increased level of development.

At the Cleveland mine 1 319 tonnes of tin were obtained from 2 708 tonnes of concentrate.

## TUNGSTEN

Tungsten is produced as scheelite by King Island Scheelite Limited at Grassy and by Tasminex N.L. from the Kara mine at Hampshire.

The first-named mined 204 157 tonnes of ore. The mill produced 1 800 tonnes of concentrates containing 133 732 metric tonne units of $WO_3$. Mine development proceeded normally.

Tasminex treated 137 265 tonnes of ore to produce two concentrate grades containing a total of 192 tonnes of $WO_3$. This was produced from the Kara No. 1 orebody.

## ZINC

The Electrolytic Zinc Company at Rosebery milled 551 702 tonnes of ore from both its West Coast mines and from the Que River mine to produce three concentrates containing 65 363 tonnes of zinc, 27 123 tonnes of lead, 1 566 tonnes of copper, 65 892 kilograms of silver and 1 156 kilograms of gold.

The zinc concentrates are treated at the Company's Risdon works together with concentrates from the Broken Hill, Elura and Mount Isa mines.

## METAL PRICES

The following table shows the average Australian metal prices:—

| *Commodity* | *Unit* | *1980–81* | *1981–82* | *1982–83* |
|---|---|---|---|---|
| | | $ | $ | $ |
| Copper | tonne | 1 698·25 | 1 460·00 | 1 695·00 |
| Gold | kilogram | 15 524·38 | 11 198·00 | 14 605·00 |
| Lead | tonne | 679·17 | 654·00 | 600·00 |
| Silver | kilogram | 421·73 | 234·80 | 347·75 |
| Tin | tonne | 13 457·25 | 14 259·00 | 15 240·00 |
| Tungsten | m.t.u. | 125·14 | 111·95 | 93·68 |
| Zinc | tonne | 725·25 | 849·58 | 871·91 |

## GENERAL

There has been some improvement in the prices of major metallic minerals compared with 1981–82. This has not resulted in an improvement in returns for most producers as there is still a general over supply situation throughout the world. The best that could be said for the improved prices was that they helped to reduce the impact of cost increases which had to be borne, e.g. wages, transport.

## COPPER

The Australian price in July 1982 of $1 460 was $20 down on the corresponding period in 1981. However, it moved up considerably to reach a peak of $2 020 in May 1983, after showing a steady improvement throughout the year. The high quarterly figures were: $1 520, $1 600, $1 860 and $2 020.

The London Metal Exchange (L.M.E.) indicator showed continued interest in Copper during 1982–83. Commencing at £794 per tonne in July, it quickly moved through the £800 mark in August to reach £917 in November. Further gains were made when the price went to £1 111 in May 1983. On 30 June it sold at £1 122.

## TIN

In July 1982 the Australian price was $13 791 per tonne, this being the lowest figure during 1982–83. The market also showed an improvement and whilst the average was $15 240 over the year, the peak was reached in April 1983 when sold at $17 309.

London Metal Exchange (L.M.E.) indicator showed tin as selling at £6 970 in August after dropping back from over £7 000 per tonne. The market then moved upwards to £7 570 in January this year. By April the price had lifted to a high of £9 260 and by late June eased back to £8 812. It was noted in March that the market had been a strong performer of late and this year saw the £9 000 mark broken for the first time since 1982.

## TUNGSTEN

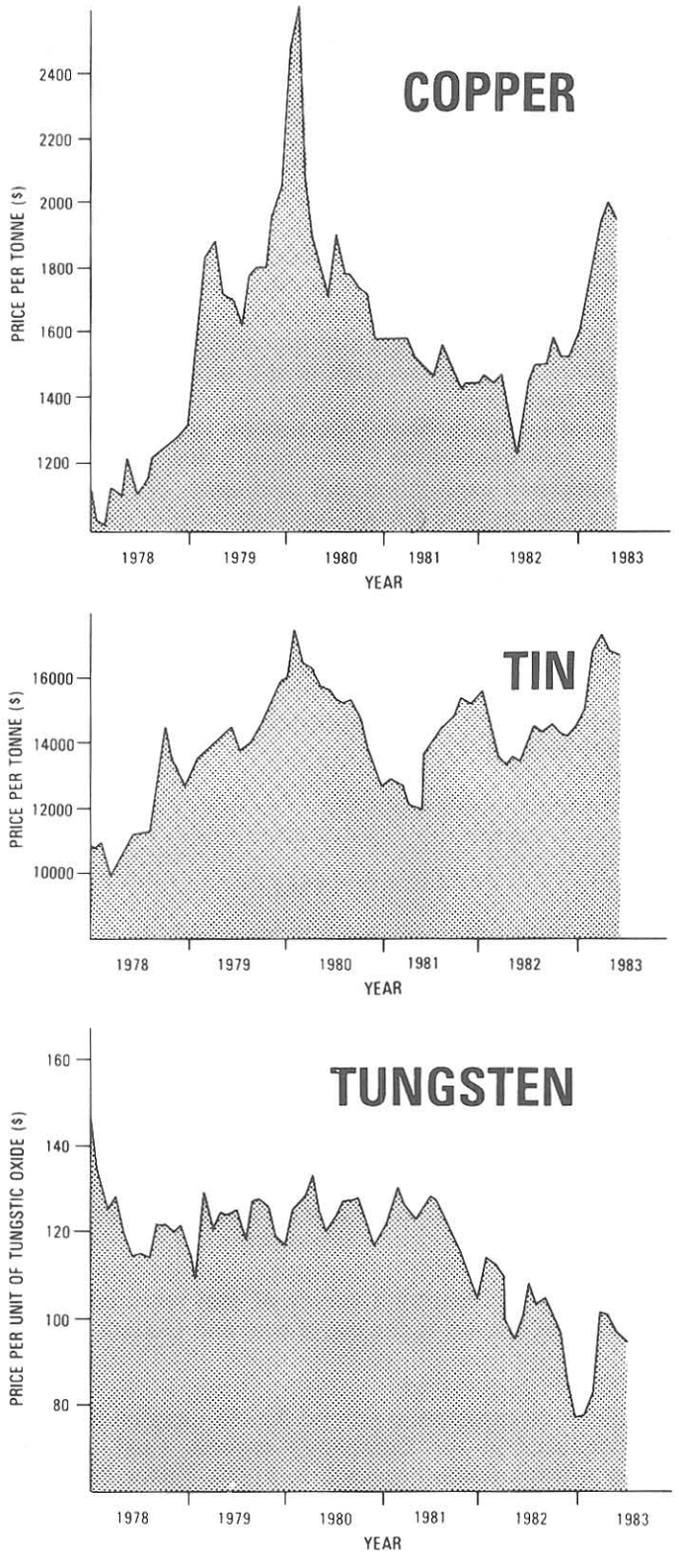
The price continued to ease with the low prices for each quarter being $100·87 in September 1982, $77·31 in December, $78·01 for March 1983 and $94·65 in June. The highest price obtained for Tungsten was $105·51 in August 1982. The average for the year was $93·68.

Overseas reports on market trends in relation to this metal were scarce with little interest appearing to be shown.

## ZINC

The Australian price rose steadily throughout the year from $796 per tonne in July 1982 to $926 per tonne in June 1983. The average price was $872 per tonne compared with $850 per tonne for 1981–82.

The LME price showed much the same pattern, i.e. a gradual rise throughout the year. The lowest price in July, 1982 was £401 per tonne and although a high of £455 per tonne was reached in October, by the end of December it had dropped back to £414 per tonne. The high price for the year was £479 per tonne in May and at the end of June it stood at £471 per tonne.




**METAL PRICES: MONTHLY AVERAGES, JANUARY 1978–JUNE 1983**

5 cm

## EXPLORATION LICENCES

This year saw a return of interest in exploration in the State. Applications received in 1982–83 exceeded the previous year's total by nineteen. Figures for the past three years are as follows:—

1980–81 — 67; 1981–82 — 45; 1982–83 — 64.

Forty-nine of the applications were for all minerals and the balance of fifteen was for coal, oil and shale areas.

The new guidelines governing exploration licences took effect on 1 July 1982 and applied throughout the year. The objective of the guidelines is to promote more active exploration by imposing a limit on the time that a licence can be held and by introducing a compulsory reduction of 50 per cent during the first five years of tenure. The size of licences is also limited to 250 $km^2$ for minerals and 500 $km^2$ for coal, oil and shale. Previously there had been no limit to the area which could be held in one licence.

The moratorium imposed on South-West Tasmania on 19 September 1978 was lifted in March 1983. The lifting of this restriction now enables the Government's development policy to be implemented. This is to encourage strictly supervised exploration and evaluation of Tasmania's mineral resources. Seven applications for exploration licences have already been received for areas in the South-West Conservation Area. The programmes for these areas will be assessed by a Working Group chaired by the Department of Mines and including representatives of the Forestry Commission, National Parks and Wildlife Service and the Department of the Environment.

At 30 June there were ninety current exploration licences and five special prospector's licences.

Expenditure on exploration for the year amounted to $12 724 450. This compares with $11 354 367 in 1980–81 and $12 167 041 in 1981–82

## COAL

All coal came from the Cornwall Coal Company N.L. at its Duncan and Blackwood mines. Production totalled 548 354 tonnes. This was an increase of 38 per cent over the previous year. The workforce of 146 and the number employed underground were virtually unchanged.

The Blackwood mine produced 175 204 tonnes with a complement of twenty-two men and Duncan produced 373 150 tonnes and employed eighty men.

In the Duncan Colliery pillar extraction in the north-east workings was completed by September 1982 increasing the availability of equipment for development to the north for 1 300 metres through poor ground. The southern workings continued to the east for a further 400 metres then turned south with little improvement in quality.

The Department of Mines is preparing a survey of coal resources of Tasmania. There has been a trend for Tasmanian industry to convert to the use of coal and Goliath Cement and Edgells are examples of this.

Capricorn Mining continued exploration around the old Langloh mine but the area of its exploration licence E.L. 27/79 was reduced at the Company's request. Coal deposits underlie private land at Woodbury but the holder of exploration licence E.L. 31/80, Victor Petroleum and Resources, has been unable to negotiate an agreement with the land owners to enable the issue of mining leases.

The Shell Company under Exploration Licence 5/61 for the Mount Nicholas area has concluded its exploration work pending the emergence of markets for the deposit.

With the abandonment of the Gordon-below-Franklin hydro power scheme the only economic alternative is a coal fired station. Sufficient coal reserves exist in the State for this purpose.

## OIL

The following table shows details of permits issued under the Petroleum (Submerged Lands) Act 1967 which were current at 30 June 1983:—

| *Title* | *Holder* | *Blocks* | *Expiry Date* |
|---|---|---|---|
| T/12P | Amoco Australia Petroleum Company and Tasman Oil Inc. | 60 | 4.4.85 |
| T/13P | Otter Exploration N.L. .... .... .... | 224 | 4.4.85 |
| T/14P | Cue Minerals N.L. .... .... .... .... | 42 | 9.1.86 |
| T/15P | Weaver Oil and Gas Corp. Aust. | 272 | 19.2.86 |
| T/16P | Weaver Oil and Gas Corp. Aust. | 32 | 19.7.86 |
| T/17P | Van Diemen's Land Resources N.L. and Others .... .... .... .... .... | 16 | 7.8.86 |
| T/18P | Bass Strait Oil and Gas N.L. and Others .... .... .... .... .... | 118 | 22.7.86 |
| T/19P | Perthshire Petroleum Ltd .... .... | 243 | 27.3.87 |
| T/20P | Van Diemen's Land Resources N.L. and Others .... .... .... .... .... | 75 | 17.11.87 |

The following brief details give an indication of the work carried out by permit holders during the year:—

T/5P. An application to surrender the 16 blocks was accepted by the Designated Authority on 18 January 1983. Notice was published in the Tasmanian Government Gazette of 12 January 1983.

T/6P. An application to surrender the 32 blocks was accepted by the Designated Authority on 18 January 1983. Notice was published in the Tasmanian Government Gazette of 12 January 1983.

T/12P. Amoco and joint venture partners drilled Cape Sorell No. 1 about 20 km offshore from Strahan. The well was spudded in on 5 July 1982 and reached a total depth of 11 576 feet on 3 September before being abandoned. Water depth was 308 feet. Drilling unit was the Diamond M Epoch. An application to surrender the permit was received on 31 March 1983.

T/13P. Additional seismic survey work was done in November 1982 and April 1983. Union Texas Australia Inc. submitted a Heads of Agreement for approval.

T/14P. Routine regional geological studies continued, together with further geophysical mapping. The consortium is still proceeding with farm-out negotiations.

T/15P. Approval was given to the permit holder to rotate the work programmes for Years 3 and 4 in June. This was done to allow time to collect and integrate the new Bureau of Mineral Resources seismic data.

T/16P. Interpretation of the Egg Island seismic survey of 347 km was completed. Studies were also carried out on the Tasmanian Devil seismic anomaly, the Sea Eagle seismic anomaly and Pelican and Squid structural anomalies.

T/17P. Routine regional geophysical studies were conducted. The consortium is still proceeding with farm-out negotiations.

T/18P. Routine geophysical mapping and geological studies continued on the permit. Farm-out negotiations still proceeding.

T/19P. Carried out seismic surveys of 792·5 km instead of the minimum of 300 km. Seismic data were shipped to Houston for processing.

T/20P. Routine regional geophysical studies were conducted. The consortium is still proceeding with farm-out negotiations.

Amendments to the Commonwealth Act made in 1980 and 1981 and new Acts passed by the Northern Territory and the States in 1981 and 1982 came into effect on 14 February 1983.

Commonwealth legislation regulates activities beyond the three mile territorial sea. Each State administers its own adjacent area.

## LEGISLATION

### PETROLEUM (SUBMERGED LANDS) ACT 1982

This Act came into effect on 14 February 1983 concurrently with the Petroleum (Submerged Lands) Amendment Act 1980 of the Commonwealth. All petroleum exploration and recovery in offshore areas is governed by a common Australian mining code, with Commonwealth legislation effective beyond the limit of the three-mile Territorial Sea and State legislation applicable within that limit.

The Act established the administrative framework for the exploration and recovery of petroleum resources from areas adjacent to the coast of Tasmania. A Joint Authority consisting of the Commonwealth and State Ministers administering the Act is responsible for major decisions. The State has responsibility for administration of day-to-day operations.

The arrangements for the sharing of petroleum royalties in effect since 1967 will continue to apply.

## AUSTRALIAN MINERALS AND ENERGY COUNCIL

The Council, comprised of the State and Commonwealth Ministers for Mines and Energy, met on 4 and 5 August 1982 in Darwin.

Important matters discussed included —

(1) Developments in international markets for minerals and energy products.
(2) Joint Commonwealth/State offshore petroleum legislation.
(3) Review of offshore petroleum royalties.
(4) Planning for a national fuel emergency.
(5) Petroleum exploration activity.
(6) National Energy Conservation Programme.
(7) State Geological Surveys/Bureau of Mineral Resources consultation.
(8) Commonwealth/State co-operation in a national assessment of resoures.
(9) Australian Heritage Commission Act.
(10) World oil and gas situation.
(11) Waste oil recovery.

The Tasmanian Minister for Mines, The Honourable F. Roger Groom, addressed the Council on the Australian Heritage Commission and cited a case when the act of listing a place on the Register of the National Estate brought commercial negotiations on a potential tin development project to a close. On the impact of the tin production quotas, the Minister referred to the severe difficulties encountered by the small tin miners as a result of this system.

In summarising the world energy situation, the Commonwealth Minister for National Development and Energy, Senator John Carrick, said that the IEA had concluded that even with substantial coal development, countries would not be able to maintain an energy balance together with maintaining living standards unless there is a significant increase in nuclear power generation in the future.

## REVENUE

REVENUE COLLECTED DURING THE YEAR ENDED 30 JUNE 1983

| *Heads of Revenue* | *$* |
|---|---|
| Department of Mines (Drilling) | 325 201 |
| Rent and Fees of Auriferous and Mineral Lands | 512 346 |
| Iron Ore Royalty | 300 843 |
| Mineral Royalties | 1 780 566 |
| Survey Fees | 2 225 |
| Fees under the Dangerous Goods Act | 52 079 |
| Geological Services | 7 559 |
| | $2 980 819 |

COMPARATIVE STATEMENT OF REVENUE FROM MINES BEING RENTS, FEES, STORAGE OF EXPLOSIVES, ETC., PAID TO THE TREASURY DURING THE YEARS 1977–78 TO 1982–83

| *Year* | *$* | *Year* | *$* |
|---|---|---|---|
| 1977–1978 | 2 455 353 | 1980–1981 | 4 471 877 |
| 1978–1979 | 2 621 380 | 1981–1982 | 3 307 207 |
| 1979–1980 | 5 837 682 | 1982–1983 | 2 980 819 |

The above statement does not include Stamp Duties upon Transfer of Leases and Licences or Commonwealth Grant Water Resources.

## ROYALTIES

The royalty of 70 cents per cubic metre on sand and gravel returned $63 618.

A further $1 803 192 was collected from other mining operations. Two companies elected to pay royalty on profits, and one on proceeds. Refunds of $86 244 were paid from credits held by the Department from the previous year.

## LEASES AND LICENCES

NUMBER AND AREA OF NEW LEASES AND LICENCES ISSUED DURING THE YEARS ENDED 30 JUNE 1982 AND 30 JUNE 1983 RESPECTIVELY

| | *1981–82* | | | *1982–83* | | |
|---|---|---|---|---|---|---|
| *Leases and Licences* | *Number* | *Area (ha)* | *Sluice-heads* | *Number* | *Area (ha)* | *Sluice-heads* |
| Easements | .... | .... | .... | 2 | 11 | .... |
| Gemstones | 1 | 25 | .... | 1 | 44 | .... |
| Gold | 2 | 101 | .... | 5 | 312 | .... |
| Iron ore | 2 | 1 270 | .... | .... | .... | .... |
| Minerals | .... | .... | .... | 8 | 890 | .... |
| Sand and gravel | .... | .... | .... | 14 | 378 | .... |
| Silver, lead and zinc | .... | .... | .... | 1 | 3 | .... |
| Stone | 13 | 1 781 | .... | 7 | 169 | .... |
| Tin | 15 | 1 664 | .... | 13 | 166 | .... |
| Water | .... | .... | .... | 4 | .... | 11 |
| Total | 33 | 4 841 | .... | 55 | 1 793 | 11 |

TOTAL NUMBER OF LEASES AND LICENCES IN FORCE ON 30 JUNE 1982 AND 30 JUNE 1983

| *Leases and Licences* | *1981–82* | | | *1982–83* | | |
|---|---|---|---|---|---|---|
| | *Number* | *Area (ha)* | *Sluice-heads* | *Number* | *Area (ha)* | *Sluice-heads* |
| Bauxite | 5 | 183 | .... | 5 | 183 | .... |
| Clay | 16 | 318 | .... | 16 | 318 | .... |
| Coal | 9 | 3 469 | .... | 9 | 3 469 | .... |
| Copper | 6 | 1 294 | .... | 6 | 1 294 | .... |
| Crocoite | 1 | 4 | .... | 1 | 4 | .... |
| Dolomite | 4 | 126 | .... | 4 | 126 | .... |
| Gemstones | 4 | 47 | .... | 4 | 67 | .... |
| Gold | 59 | 2 972 | .... | 49 | 2 783 | .... |
| Granite | 4 | 12 | .... | 4 | 12 | .... |
| Iron Ore | 12 | 3 528 | .... | 12 | 3 528 | .... |
| Kaolin | 1 | 346 | .... | 1 | 340 | .... |
| Limestone | 10 | 1 243 | .... | 10 | 1 243 | .... |
| Marble | 1 | 8 | .... | 1 | 8 | .... |
| Minerals | 38 | 6 653 | .... | 42 | 6 803 | .... |
| Osmiridium and chromite | 2 | 184 | .... | .... | .... | .... |
| Peat | 1 | 72 | .... | 1 | 72 | .... |
| Sand and gravel | 104 | 8 385 | .... | 114 | 7 940 | .... |
| Silica | 10 | 728 | .... | 10 | 728 | .... |
| Slate | 1 | 84 | .... | 1 | 84 | .... |
| Stone | 116 | 8 178 | .... | 119 | 8 206 | .... |
| Silver, lead and zinc | 17 | 892 | .... | 18 | 895 | .... |
| Tin | 355 | 16 957 | .... | 320 | 14 910 | .... |
| Uranium | 1 | 81 | .... | 1 | 81 | .... |
| Wolfram and tin | 10 | 199 | .... | 9 | 191 | .... |
| Water | 85 | .... | 908 | 71 | .... | 774 |
| Easements | 91 | 1 924 | .... | 89 | 1 922 | .... |
| Total | 963 | 57 807 | 908 | 917 | 55 207 | 774 |

NUMBER AND AREA OF LEASES AND LICENCES APPLIED DURING THE YEARS ENDING 30 JUNE 1982 AND 30 JUNE 1983 RESPECTIVELY

| *Leases and Licences* | *1981–82* | | | *1982–83* | | |
|---|---|---|---|---|---|---|
| | *Number* | *Area (ha)* | *Sluice-heads* | *Number* | *Area (ha)* | *Sluice-heads* |
| Coal | 10 | 1 620 | .... | 2 | 217 | .... |
| Copper | .... | .... | .... | 1 | 65 | .... |
| Cassiterite | .... | .... | .... | 1 | 30 | .... |
| Gold | 7 | 124 | .... | 7 | 58 | .... |
| Minerals | 4 | 564 | .... | 11 | 251 | .... |
| Osmiridium | .... | .... | .... | 1 | 1 | .... |
| Sand and gravel | 7 | 675 | .... | 24 | 963 | .... |
| Shellgrit | 1 | 2 | .... | .... | .... | .... |
| Silver, lead and zinc | 1 | 28 | .... | 1 | 32 | .... |
| Stone | 12 | 1 124 | .... | 22 | 5 994 | .... |
| Tin | 25 | 839 | .... | 11 | 217 | .... |
| Easements | 3 | 23 | .... | 1 | 3 | .... |
| Water | 1 | .... | 4 | 6 | .... | 16 |
| Total | 71 | 4 999 | 4 | 88 | 7 831 | 16 |

TOTAL NUMBER OF ALL TYPES OF PROSPECTING RIGHTS HELD
AS AT 30 JUNE 1982 AND 30 JUNE 1983 RESPECTIVELY

| *Mining Tenement* | *1981–82* | | *1982–83* | |
|---|---|---|---|---|
| | *Number* | *Area* | *Number* | *Area* |
| Permits to enter and search on private land, including owners' consents | 9 | 16 726 ha | .... | .... |
| Exploration licences | 111 | 44 641 km² | 85 | 20 536 km² |
| Special Prospectors' licences | 5 | 136 km² | 5 | 206 km² |
| Miners' Rights | 4 | 1 ha | 4 | 2 ha |
| Prospectors' licences | 23 | 505 ha | 30 | 647 ha |
| Authorities to prospect under the Aid to Mining Act 1927 | 3 | 1 409 ha | 3 | 1 409 ha |
| Permits to explore for petroleum under the Petroleum (Submerged Lands) Act 1967 | 11 | 1 071 blocks | 8 | 1 062 blocks |

## MINES DRAFTING SECTION

Four new series 1:20 000 mining tenement maps were produced during the year — Gladstone, Pioneer, Mt Arthur and Monarch.

Pioneer is on the new format and so covers the same area as the corresponding 1:25 000 Lands Department map. It includes the Mt Horror area which was issued in the old, under square format, series.

The Lanka sheet is at proof copy stage and should be available by December 1983. Lanka is also on the larger format.

Derby, Blue Tier and Lynchford sheets are to be completed by May 1984.

The section is preparing for the introduction of a microcomputer towards the end of 1983 and three officers have undertaken computer courses at matriculation and T.A.F.E. colleges. This grounding should ensure a smooth entry to this most modern cartographic aid. The primary use of this computer will be in the plotting of mining tenement and private land details. Microfilming of drafting records has continued at a steady pace with a further 2 933 frames filmed. These include Mines Inspection Act plans, underground mine plans, security updates, Rosny Park Building plans, aerial photo index and various miscellaneous plans.

Filming of underground plans is now at a standstill due to lack of staff able to spend time on inventory and logging.

The section completed details on 1:500 000 and 1:100 000 charts of all National Estate areas under the Australian Heritage Commission Act 1975, both proposed (interim list) and registered areas. These charts have been used extensively by other Departments.

Monitoring of lands under the Australian Heritage Commission Act and other Acts affecting land tenure in the State remains an important function of the office.

An exploration licence schedule has been developed to show at a glance all exploration details. It contains in column form the following details: Date of Receipt: Applicant's Name; whether the licence is a New Application, a Cancellation, Area Reduction, or Renewal; and a final column for Remarks.

This schedule has gained wide acceptance by exploration companies for monitoring licence movements.

This section introduced a new system for newspaper advertising of exploration licence applications. As well as the traditional description by co-ordinates or ' metes and bounds ' a pictorial presentation has been included. This has proved of great benefit to the lay person in the ease of identification and has minimised the chances of misinterpretation of the area.

The Department's policy to have all licences follow the metric grid system (using the 1:100 000 Lands Department series) is gaining momentum with all new applications using this square grid system.

Difficulties still exist particulary in the complex western portion of the State.

Computer print-out facilities of mining tenements has continued to gain acceptance and all exploration licence documents now include this facility. Other Government Departments and councils use these records for land utilisation and rating systems.

Sixty-four applications for special prospecting and exploration licences were received by this section for processing which includes checking detail, determining availability, recording and describing.

Eighty applications for mineral leases on Crown Land and private property were processed and recorded. Grant details for private land applications were searched for mineral rights. There were numerous recordings of water licences, prospecting licences and miners rights.

Working charts and transparencies now total 580. The increase from last year includes 1:25 000 Lands Department land tenure series which are being used to replace outdated land district charts on imperial scales.

There were twenty-six special plans produced, including Exempt Areas; engineering drawings, e.g. ' Bulk Oxygen Storage System '; mine plans and World Heritage plans.

Forty-eight plans for licence documentation were drawn subject-to-survey and a further nine were drawn from survey information.

Two thousand one hundred requests for searching mining details on land transfer applications were made. These search requests have increased dramatically and have made inroads into daily office routines. Search times range from two minutes to fifteen minutes, the equivalent of about thirty-five working days per annum.

The section dealt with 200 requests for mining information from the Lands Department and Forestry Commission regarding Crown land rental and purchase, and forest lease applications.

Three thousand five hundred dyeline copies were produced for office use and sale to the public including about 1 800 exploration licence sheets.

Photostat machine copies for sale and office use totalled 169 600.

## COURT OF MINES

*Four objectors v C.R.A. Exploration Pty Ltd.* Objection to E.L. 11/82. This did not proceed and the application for the exploration licence was withdrawn on 2 November 1982.

*Two objectors v C.R.A. Exploration Pty Ltd.* Objection to E.L. 9/82, Exeter. The application was dismissed on 29 November 1982.

*Three objectors v C.R.A. Exploration Pty Ltd.* Objection to E.L. 10/82, Lilydale. The application for an exploration licence was withdrawn on 2 November 1982.

*Seven objectors v C.R.A. Exploration Pty Ltd.* Objection to E.L. 12/82, Poatina. The application for an exploration licence was withdrawn on 2 November 1982.

*Seventeen objectors v C.R.A. Exploration Pty Ltd.* Objection to E.L. 13/82, Meander. The application for an exploration licence was withdrawn on 2 November 1982.

*C. J. Taylor v Tasminex.* Forfeiture of Mineral Lease 100M/68, Mathinna. The lease was forfeited by the Warden on 17 January 1983. An appeal was lodged on 14 February 1983 and dismissed on 6 June 1983.

*Tasmanian Conservation Trust Inc. v Cornwall Coal Company N.L.* Objection to E.L. 22/82, Mt Foster. The application was withdrawn by the plaintiff on 15 October 1982.

*R. Daley and B. C. Woolley v F. K. H. Scheppein.* Forfeiture of leases 150M/70, 145M/70 and 19M/71. The application for forfeiture of leases 145M/70 and 19M/71 was dismissed without costs. The application for forfeiture of 150M/70 was dismissed with costs of $40 awarded against B. C. Woolley.

*Tasmanian Conservation Trust Inc. v Avoca Transport Co. Pty Ltd.* Objection to Exploration Licence 21/82, Merrywood. The case was adjourned *sine die.*

*F. K. H. Scheppein and R. Marshard v Rossarden Mines Limited.* Application for forfeiture lease 27M/77, Rossarden. The application was dismissed by consent of the parties on 29 November 1982.

*Thirty-eight objectors v Marathon Petroleum.* Objection to E.L. 29/82, Mt Lloyd. The decision was reserved on 30 May 1983. The application by the Tasmanian Conservation Trust Inc. was dismissed. The others were adjourned *sine die.* The application for the licence was withdrawn on 14 July 1983.

*Forty objectors v J. R. Wall.* Objection to E.L. 30/82, Cygnet. The application for the exploration licence was withdrawn on 4 November 1982.

*Twenty-eight objectors v Marathon Petroleum Australia Ltd.* Objection to E.L. 28/82, Strathblane. The decision was reserved on 30 May 1983. The application by the Tasmanian Conservation Trust Inc. was dismissed. The others were adjourned *sine die.* The application for the licence was withdrawn on 14 July 1983.

*Fourteen objectors v Marathon Petroleum Australia Limited.* Objection to E.L. 27/82, Geeveston. The decision was reserved on 30 May 1983. The application by the Tasmanian Conservation Trust Inc. was dismised, the others were adjourned *sine die.* The application for the licence was withdrawn on 14 July 1983.

*One hundred and twenty-seven objectors v Marathon Petroleum Australia Ltd.* To E.L. 26/82, Mt Lloyd. The application for the licence was withdrawn on 12 October 1982.

*Tasmanian Conservation Trust Inc. v Amoco Minerals Australia.* Objection to E.L. 32/82, Frome Hill. The objection was dismissed on 18 February 1983.

*Fifteen objectors v Amoco Minerals Australia.* Objection to E.L. 36/82, Cygnet. The hearing will be on 16 November 1983.

*Tasmanian Conservation Trust Inc. v C.R.A. Exploration Pty Ltd.* Objection to E.L. 40/82, Bracknell. The objection was dismissed on 18 February 1983.

*Tasmanian Conservation Trust Inc. v C.R.A. Exploration Pty Ltd.* Objection to E.L. 42/82, O'Connors Peak. The objection was dismissed on 18 February 1983.

*Tasmanian Conservation Trust Inc. v C.R.A. Exploration Pty Ltd.* Objection to E.L. 45/82, Latrobe. The objection was withdrawn on 21 February 1983.

*Twenty objectors v C.R.A. Exploration Pty Ltd.* Objection to E.L. 41/82, Quamby. The licence application was withdrawn on 8 April 1983.

*Tasmanian Conservation Trust Inc. v C.R.A. Exploration Pty Ltd.* Objection to E.L. 46/82, Hellyer. The objection was withdrawn on 21 February 1983.

*Tasmanian Wilderness Society v Base Mines Limited.* Objection to E.L. 48/82, Borradaile Plains. The application was withdrawn on 9 May 1983.

*Cleveland Tin Limited v Peko Wallsend Operations Limited.* Objection to E.L. 6/83, Luina. The matter was settled out of court.

*Tasmanian Conservation Trust Inc. v Mineral Holdings Aust. Ltd.* Objection to E.L. 1/83, Gladstone. The objection was dismissed.

*G. A. Lavell v M. B. Moorefield.* Forfeiture of lease 138M/69 and licence 2W/71 at Moina. This was forfeited by the Warden on 1 July 1983.

*P. B. Bruce v B.M.I. Mining Pty Ltd.* Forfeiture of lease 850P/M, South Mount Cameron. The case was heard on 17 May 1983 and adjourned until 15 September 1983.

*B. J. Miller v B.M.I. Mining Pty Ltd.* Forfeiture of lease 63M/73. The company was fined $250 in lieu of forfeiture.

*T. B. Brampton v Aberfoyle Exploration Pty Ltd.* Application for forfeiture of leases 62M/63, 63M/63. The case was dismissed on 26 August 1983.

## MINE MANAGERS' CERTIFICATES

Metalliferous Mine Managers' Certificates were issued by the Board of Examiners under the Mines Inspection Act 1968, to the following:—

*By examination viva voce —*

| *Certificate No.* | *Name* | *Date* | *Mine* |
|---|---|---|---|
| 287/82 | Gerrit Jan Karelse | 11.10.82 | Cleveland |
| 288/83 | Alan Cameron Robertson | 14.2.83 | Renison |

Open-cut Mine Managers' Certificates of Competency were issued by the Board under the Mines Inspection Act 1968, to the following:—

| *Certificate No.* | *Name* | *Date* | *Mine* |
|---|---|---|---|
| 3/83 | Michael Edward Gardner | 6.4.83 | Savage River |

## VALUE OF TASMANIAN MINERALS IN RECENT YEARS WITH AUSTRALIAN METAL PRICES

| *Year* | *$* | *Year* | *$* |
|---|---|---|---|
| 1973–1974 | 164 699 058 | 1978–1979 | 322 919 534 |
| 1974–1975 | 173 297 481 | 1979–1980 | 372 810 760 |
| 1975–1976 | 190 490 321 | 1980–1981 | 344 392 266 |
| 1976–1977 | 277 266 070 | 1981–1982 | 372 923 295 |
| 1977–1978 | 291 496 400 | 1982–1983 | 388 647 603 |

## MINERAL PRODUCTION SINCE 1880

QUANTITY AND VALUE OF PRODUCTION AS AT 30 JUNE 1983

| *Commodity* | *Unit* | *Total Quantity* | *Total Value* |
|---|---|---|---|
| METALLIC MINERALS | | | $ |
| Antimony | (tonne) | 3 | 2 034 |
| Bismuth | (kilogram) | 110 080 | 503 385 |
| Cadmium | (tonne) | 3 565 | 13 641 933 |
| Chromite | (tonne) | 2 687 | 259 083 |
| Cobalt oxide | (kilogram) | 134 573 | 1 055 969 |
| Copper (blister) to 1918 (now shown under Silver and Copper) | (tonne) | 169 273 | 27 577 054 |
| Copper matte | (tonne) | 6 326 | 267 472 |
| Copper ore to 1918 (now shown under Copper) | (tonne) | 42 439 | 1 155 476 |
| Copper (from 1919) | (tonne) | 842 307 | 642 936 510 |
| Crocoite | (specimens only) | .... | 62 073 |
| Gold | (kilogram) | 107 067 | 162 557 335 |
| Ilmenite | (tonne) | 558 | 2 512 |
| Iron ore pellets | (tonne) | 32 198 045 | 535 475 212 |
| Iron oxide (including hematite, limonite and magnetite) | (tonne) | 337 461 | 2 092 512 |
| Lead (from 1919) | (tonne) | 632 780 | 167 895 607 |
| Manganese | (tonne) | 1 | 6 |
| Manganese dioxide (from 1957) | (tonne) | 12 574 | 455 430 |

## MINERAL PRODUCTION SINCE 1880 — *continued*

QUANTITY AND VALUE OF PRODUCTION AS AT 30 JUNE 1983 — *continued*

| *Commodity* | *Unit* | *Total Quantity* | *Total Value* |
|---|---|---|---|
| METALLIC MINERALS — *continued* | | | $ |
| Mercury | (kilogram) | 7 697 | 90 251 |
| Molybdenum | (tonne) | 72 | 276 840 |
| Monazite | (tonne) | 34 | 1 214 |
| Nickel | (tonne) | 237 | 81 036 |
| Osmiridium | (kilogram) | 881 | 1 418 771 |
| Pyrite (to 1971) | (tonne) | 2 124 070 | 10 239 957 |
| Pyrite (from 1972) | (tonne) | 1 524 975 | .... |
| Rutile | (tonne) | 1 | 36 |
| Rutile (concentrates) | (tonne) | 40 027 | 8 270 047 |
| Scheelite (concentrates) | (tonne) | 57 261 | 287 476 572 |
| Silica for silicon alloy production | (tonne) | 370 516 | 8 046 999 |
| Silicon as silicon alloys | (tonne) | 441 432 | 113 308 045 |
| Silver-lead ore to 1918 (now shown under Silver and Lead) | (tonne) | 1 101 295 | 12 858 582 |
| Silver (from 1919) | (kilogram) | 2 416 231 | 180 390 013 |
| Sulphur as sulphuric acid | (mono tonne) | 4 461 934 | 87 417 689 |
| Tin | (tonne) | 249 325 | 892 712 111 |
| Wolfram (concentrates) | (tonne) | 23 947 | 65 284 842 |
| Zinc | (tonne) | 1 712 603 | 625 724 400 |
| Zinc sulphate (from 1957) | (tonne) | 3 251 | 324 177 |
| Zircon (concentrates) | (tonne) | 39 001 | 5 039 899 |
| NON-METALLIC MINERALS | | | |
| Asbestos | (tonne) | 4 044 | 34 284 |
| Barite | (tonne) | 2 240 | 16 478 |
| Clay (from 1958) — | | | |
| Brick | (metre³) | 1 896 928 | 5 669 163 |
| Tile | (metre³) | 71 310 | 182 009 |
| Other | (metre³) | 608 370 | 2 666 281 |
| Dolomite | (tonne) | 160 611 | 1 627 512 |
| Graphite | (tonne) | 41 | 214 |
| Kaolin | (tonne) | 230 993 | 11 260 779 |
| Limestone — | | | |
| Agricultural and other | (tonne) | 1 579 264 | 5 768 616 |
| Carbide | (tonne) | 1 081 509 | 5 936 189 |
| Cement | (tonne) | 12 883 639 | 26 436 934 |
| Chemical and metallurgical | (tonne) | 5 351 796 | 13 505 751 |
| Ochre | (tonne) | 2 949 | 23 483 |
| Pebbles (from 1957) | (tonne) | 30 597 | 711 647 |
| Sand (moulding) | (tonne) | 864 | 9 550 |
| Silica | (tonne) | 467 120 | 1 415 769 |
| Talc | (tonne) | 338 | 2 154 |
| FUEL MINERALS | | | |
| Coal | (tonne) | 12 887 966 | 68 970 478 |
| Shale | (tonne) | 42 239 | 62 462 |
| Peat | (tonne) | 12 426 | 985 450 |
| CONSTRUCTION MATERIALS | | | |
| Building stone — | | | |
| Freestone | (metre³) | 17 200 | 1 001 491 |
| Granite | (metre³) | 68 291 | 351 242 |
| Other stone | (metre³) | 14 881 | 211 188 |
| Crushed and broken stone (from 1958) — | | | |
| Basalt | (metre³) | 6 356 164 | 45 183 376 |
| Dolerite | (metre³) | 11 143 209 | 60 797 502 |
| Limestone | (metre³) | 504 165 | 2 631 713 |
| Sandstone | (metre³) | 78 126 | 474 728 |
| Other | (metre³) | 6 289 408 | 41 283 464 |
| Gravel (from 1958) | (metre³) | 28 381 804 | 87 008 734 |
| Sand (from 1958) | (metre³) | 3 645 368 | 14 217 438 |
| Other road-making material | (metre³) | 3 906 432 | 9 999 095 |
| | | | $4 263 346 258 |

# STATISTICS RELATING TO THE MINERAL INDUSTRY

| Commodity | Unit | Year ended 30 June 1982 — Total Quantity | Year ended 30 June 1982 — Value | Year ended 30 June 1983 — Total Quantity | Year ended 30 June 1983 — Value |
|---|---|---|---|---|---|
| METALLIC MINERALS | | | $ | | $ |
| Cadmium | (tonne) | 154 | 468 044 | 158 | 348 373 |
| Chromite | (tonne) | .... | .... | .... | .... |
| Cobalt oxide | (kilogram) | 2 393 | 64 405 | 2 395 | 38 933 |
| Copper | (tonne) | 20 830 | 30 373 126 | 19 856 | 34 378 674 |
| Crocoite | (specimens only) | 500 | 4 692 | Specimens | 8 914 |
| Gold | (kilogram) | 1 676 | 18 867 913 | 1 561 | 23 131 955 |
| Iron ore pellets | (tonne) | 1 994 263 | 42 301 052 | 2 294 344 | 57 349 496 |
| Iron oxide | (tonne) | 25 490 | 272 000 | 13 570 | 156 600 |
| Lead | (tonne) | 23 976 | 15 798 934 | 27 123 | 16 273 800 |
| Manganese dioxide | (tonne) | 410 | 14 342 | 136 | 3 450 |
| Molybdenum | (tonne) | 17 | 64 524 | 10 | 39 144 |
| Silica for silicon alloy production | (tonne) | 32 961 | 824 025 | 22 347 | 558 675 |
| Silicon as silicon alloys | (tonne) | 58 414 | 22 195 770 | 26 543 | 12 382 509 |
| Silver | (kilogram) | 71 232 | 16 654 659 | 68 874 | 24 218 368 |
| Sulphur — | | | | | |
| Sulphuric acid from zinc concentrates | (mono tonne) | 120 660 | 4 360 993 | 120 267 | 5 206 187 |
| Tin | (tonne) | 6 981 | 98 834 194 | 6 477 | 97 458 044 |
| Tungsten as tungstic oxide | (tonne) | 2 465 | 27 811 348 | 1 533 | 14 494 384 |
| Zinc | (tonne) | 65 122 | 55 642 155 | 65 363 | 57 161 528 |
| VALUE OF METALLIC MINERALS | | .... | $334 552 176 | .... | $343 209 034 |
| NON-METALLIC MINERALS | | | | | |
| Clay — | | | | | |
| Brick | (metre³) | 75 887 | 389 152 | 51 213 | 256 379 |
| Other | (metre³) | 27 582 | 182 690 | 23 670 | 118 183 |
| Dolomite | (tonne) | 13 632 | 202 497 | 17 755 | 273 889 |
| Kaolin | (tonne) | 18 424 | 1 650 390 | 14 909 | 1 544 402 |
| Limestone — | | | | | |
| Agricultural | (tonne) | 50 830 | 386 946 | 63 921 | 547 900 |
| Carbide | (tonne) | .... | .... | .... | .... |
| Cement | (tonne) | 667 014 | 2 001 042 | 611 583 | 1 834 749 |
| Chemical and metallurgical | (tonne) | 93 693 | 793 597 | 105 556 | 902 157 |
| Other | (tonne) | 11 242 | 37 136 | 10 286 | 41 208 |
| Pebbles | (tonne) | 2 372 | 77 880 | 1 222 | 62 155 |
| Silica | (tonne) | 11 935 | 69 356 | 15 844 | 89 355 |
| VALUE OF NON-METALLIC MINERALS | | .... | $5 790 686 | .... | $5 670 377 |
| FUEL MINERALS | | | | | |
| Coal | (tonne) | 395 347 | 9 195 727 | 548 354 | 12 712 520 |
| Peat | (tonne) | 565 | 142 828 | 890 | 184 230 |
| VALUE OF FUEL MINERALS | | .... | $9 338 555 | .... | $12 896 750 |
| CONSTRUCTION MATERIALS | | | | | |
| Building stone — | | | | | |
| Freestone | (metre³) | 260 | 21 360 | 112 | 4 210 |
| Granite | (metre³) | .... | .... | .... | .... |
| Granite (red) | (metre³) | 200 | 2 000 | 452 | 4 520 |
| Other | (metre³) | .... | .... | 184 | 76 500 |

## STATISTICS RELATING TO THE MINERAL INDUSTRY — *continued*

| *Commodity* | *Unit* | *Year ended 30 June 1982* | | *Year ended 30 June 1983* | |
|---|---|---|---|---|---|
| | | *Total Quantity* | *Value* | *Total Quantity* | *Value* |
| Crushed and broken stone — | | | $ | | $ |
| Basalt | (metre³) | 515 730 | 5 427 636 | 560 629 | 5 997 109 |
| Dolerite | (metre³) | 323 667 | 3 295 058 | 449 092 | 4 873 745 |
| Limestone | (metre³) | 16 233 | 162 870 | 22 655 | 227 440 |
| Sandstone | (metre³) | 15 135 | 153 830 | 8 910 | 90 820 |
| Other | (metre³) | 605 138 | 6 051 380 | 553 056 | 5 440 649 |
| Gravel | (metre³) | 1 131 313 | 6 737 890 | 1 316 237 | 7 916 745 |
| Sand | (metre³) | 166 954 | 1 004 903 | 229 566 | 1 469 497 |
| Other road-making materials | (metre³) | 76 646 | 384 951 | 149 535 | 770 207 |
| VALUE OF CONSTRUCTION MATERIALS | | .... | $23 241 878 | .... | $26 871 442 |
| TOTAL VALUE WITH AUSTRALIAN METAL PRICES | | .... | $372 923 295 | .... | $388 647 603 |
| METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES | | .... | $342 977 814 | .... | $341 455 020 |
| VALUE OF MINING AND METALLURGICAL PRODUCTION | | .... | $715 901 109 | .... | $730 102 623 |
| AVERAGE NUMBER OF EMPLOYEES | | .... | 9 422 | .... | 8 425 |

## AID TO MINING

Under the provisions of the Aid to Mining Act 1927 financial assistance may be made available to companies or individuals who hold mineral leases. Loans are secured by a registered mortgage deed and repayments are required at the rate of 7·5 per cent of the proceeds of minerals produced or sold.

Assistance totalling $71 500 was made available to four applicants during 1982–1983. The funds were to assist with the purchase of a pump and pipes, a dozer, a payloader and an excavator.

## STAFF MOVEMENTS

| *Name* | *Position* | *Remarks* | |
|---|---|---|---|
| Bonham, D. | Inspector of Explosives | Retired | 4.11.82 |
| Christianson, A. S. | Mining Engineer | Commenced | 12.7.82 |
| Clements, D. | Clay technologist | Redundant | 13.10.82 |
| Gafar, K. | Clerk | Commenced | 9.6.83 |
| Grun, W. | Mining Engineer | Commenced | 27.1.83 |
| Hillhouse, J. M. | Electrical Engineer | Commenced | 17.1.83 |
| Hudspeth, Dr J. W. | Assistant Geophysicist | Commenced | 6.6.83 |
| Polya, D. A. | Geologist | Resigned | 29.10.82 |
| Reeves, A. J. | Research Officer | Commenced | 6.6.83 |
| Smith, S. | Inspector of Explosives | Promoted | 24.2.83 |
| Thompson, A. | Laboratory Technician | Resigned | 3.9.82 |

## OVERSEAS VISIT

Geologist A. V. Brown, attended a scientific assembly, sponsored by the International Association of Volcanology and Geochemistry of the Earth's Interior and the International Association of Geochemistry and Cosmochemistry, in Reykjavik, Iceland from 15–22 August. At this meeting he delivered a paper entitled ' High-magnesian andesites within a Cambrian continental rift environment, western Tasmania '. Prior to the meeting he attended a six day field trip across Iceland in order to study the different products of an active volcanic terrain.

Following the Icelandic Symposium, from 1–10 September, he attended a conference and field discussion meeting entitled ' Volcanic processes in marginal basins '. This meeting was sponsored by the Geological Society of London and organised by the Volcanic Studies Group. The field meeting covered the classic Ordovician volcanic terrains of the Welsh Basin, and the conference was held at the University of Keele, England.

## CONCLUSION

Appreciation is recorded of the services rendered by the officers of the Department, Wardens of Mines, Registrars of Mines and police officers who act as collectors of revenue for the Department throughout the State.

A detailed review of operations and production, and the reports of the Geological Survey Branch, the Chemical and Metallurgical Branch, the Mines and Explosives Branch, the Mount Cameron Water Race Board and the Ringarooma and Cascade Water Board follow.

H. MURCHIE, Director of Mines.

# OPERATIONS AND PRODUCTION

## 1. METALLIC MINERALS

### CADMIUM

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value ($)* | *Year* | *Tonnes* | *Value ($)* |
|---|---|---|---|---|---|
| 1927–1978 .... .... .... .... .... | 2 938 | 11 159 846 | 1980–1981 .... .... .... .... .... | 106 | 462 800 |
| 1979 .... .... .... .... .... .... | 141 | 760 870 | 1981–1982 .... .... .... .... .... | 154 | 468 044 |
| 1980* .... .... .... .... .... .... | 68 | 442 000 | 1982–1983 .... .... .... .... .... | 158 | 348 373 |
| | | | Total .... .... .... .... .... | 3 565 | $13 641 933 |

* January to June.

This is a by-product obtained by the Electrolytic Zinc Company of Australasia Ltd at its Risdon Works from zinc concentrates produced from the Rosebery and Williamsford mines.

### CHROMITE

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value ($)* | *Year* | *Tonnes* | *Value ($)* |
|---|---|---|---|---|---|
| 1978 .... .... .... .... .... .... | 684 | 61 312 | 1980–1981 .... .... .... .... .... | 567 | 63 236 |
| 1979 .... .... .... .... .... .... | 1 006 | 89 420 | 1981–1982 .... .... .... .... .... | .... | .... |
| 1980* .... .... .... .... .... .... | 432 | 45 115 | 1982–1983 .... .... .... .... .... | .... | .... |
| | | | Total .... .... .... .... .... | 2 689 | $259 083 |

* January to June.

### NORTHERN CHROMITE, BEACONSFIELD

The Company has reported that it has no intention of re-opening the mine, which is situated 4 km south-west of Beaconsfield.

Some further planting of seedlings was carried out on the old Barnes Hill mine site in areas delineated by the Department of the Environment.

### COBALT OXIDE

The source of the 2·395 tonnes of cobalt oxide of value $38 933 was the same as that of cadmium.

### COPPER

SOURCE, QUANTITY AND VALUE OF PRODUCTION

| | *From tin ores* | | *From lead-zinc ores* | | *In blister copper* | | *From copper ores* | | *Totals* | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Year* | *Tonnes* | *$* | *Tonnes* | *$* | *Tonnes* | *$* | *Tonnes* | *$* | *Tonnes* | *$* |
| 1919–1978 | 7 179 | 8 063 883 | 38 278 | 35 699 851 | 501 143 | 208 564 870 | 200 804 | 228 079 275 | 747 404 | 480 407 079 |
| 1979 .... | 453 | 820 955 | 2 318 | 4 172 383 | .... | .... | 18 255 | 32 865 587 | 21 026 | 37 858 925 |
| 1980* .... | 228 | 478 990 | 1 336 | 2 787 693 | .... | .... | 8 034 | 17 068 809 | 9 598 | 20 335 492 |
| 1980–1981 | 401 | 659 976 | 2 045 | 3 415 383 | .... | .... | 21 147 | 35 507 855 | 23 593 | 39 583 214 |
| 1981–1982 | 681 | 993 370 | 2 289 | 3 345 554 | .... | .... | 17 860 | 26 034 202 | 20 830 | 30 373 126 |
| 1982–1983 | 446 | 751 194 | 1 566 | 2 657 160 | .... | .... | 17 844 | 30 970 320 | 19 856 | 34 378 674 |
| Totals | 9 388 | $11 767 568 | 47 832 | $52 078 024 | 501 143 | $208 564 870 | 283 944 | $370 526 048 | 842 307 | $642 936 510 |

* January to June.

## THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN

T. E. Evans, Mining Engineer, Burnie, reports —

### PRODUCTION

Production for the year ended 30 June was as follows:—

Tonnage of ore hauled from the mine —

| *Source* | *Tonnes* |
|---|---|
| Prince Lyell and 'A' Lens | 1 270 433 |
| Cape Horn | 122 614 |
| Crown 12 West | 10 063 |
| North Lyell | 28 447 |
| Total mine | 1 431 557 |
| Grade of ore hauled (% copper) | 1·33 |
| Ore treated at the concentrator (tonnes) | 1 433 043 |
| Copper concentrate produced (tonnes) | 68 446 |

Ore production was adversely affected by two mine shutdowns, which halted operations for 41 days. Copper production, however, was held at the level of the previous year due to a marked improvement in the grade of ore mined and milled.

The first of the shutdowns took place from 30 August to 8 October 1982 and was caused by the depressed state of the metal market. The second, from 1 to 16 November 1982, was made necessary by ground movement distorting a number of steel supports installed in the Main Decline making the decline impassible to the haulage trucks.

The bulk of the ore mined came from underground sources, but, for the first time since 1978, some ore was mined by open-cut.

A substantial tonnage of near-surface ore was defined in the North Lyell area of the mineral lease and open-cut operations to mine this were started in March 1983. The ore produced was of 2·32 per cent copper and significantly contributed to the raising of the overall mine grade.

Once again, open stoping was the most important method of mining employed, being responsible for the bulk of the ore produced from Prince Lyell, 'A' Lens and Cape Horn. Sub-level caving was employed at Crown 12 West, where 10 063 tonnes of ore were produced at a grade of 9·7 per cent copper.

Two pillar firings were carried out in the Prince Lyell 30 Series of stopes. The 37/38 crown and rib pillars amounting to 141 500 tonnes of ore were fired in March 1983 and the 36/37 crown and rib pillars amounting to 241 000 tonnes of ore were fired in May 1983. The two firings consumed a total of 126 tonnes of explosives and were completely successful.

### MINE DEVELOPMENT

The mine development achieved during the period is summarised as follows:—

| *Mine Area* | *Lateral development (metres)* | *Raises (metres)* | *Total (metres)* |
|---|---|---|---|
| Prince Lyell and 'A' Lens — 20 and 30 Series areas | 3 031 | 484 | 3 515 |
| Prince Lyell No. 1 Shaft area | 174 | 8 | 182 |
| Main Decline to 40 Series | 363 | .... | 363 |
| Main Decline bypass | 102 | .... | 102 |
| Cape Horn | 702 | 134 | 836 |
| Crown 12 West | 20 | .... | 20 |
| Total mine | 4 392 | 626 | 5 018 |

Development of the Main Decline continued down towards the horizon of the 40 Series stopes. The advance was less than that planned because of difficult ground conditions.

Difficult ground conditions were also encountered in other development areas and ground support again formed a significant part of development operations.

Excavation for the new pumping facility situated on and between the 17 and 18 levels was completed. Civil-type construction and mechanical installation in connection with the facility have commenced.

To remedy the situation in the Main Decline created by the Steel-sett distortion, a 102-metre bypass was mined around the affected region.

## Exploration

Expenditure on exploration within the mineral lease amounted to $193 450. Activity included the drilling of twenty-five diamond-drill holes having a combined length of 3 423·5 metres.

Twenty-one of these holes, 2 477·6 metres in total length, were drilled to evaluate the 40 Series areas of the Prince Lyell, 'A' Lens and Royal Tharsis orebodies. One, 80·9 metres long, was drilled to test ground conditions ahead of the Main Decline face. Another 392·9 metres long, was drilled as part of a programme testing extension of the Prince Lyell orebody down to 17 Level. Two, 472·1 metres in total length, were drilled as part of an exploration programme in the North Lyell area.

These last-mentioned holes were drilled to test a weak geophysical anomally occurring immediately above some old stopes at North Lyell. They obtained a negative result in this respect but revealed the presence of a small high-grade secondary enriched zone of ore very close to surface and it is this zone that is now being mined by open-cut.

### Reported Ore Reserves as at 30 June 1983

| *Mine* | *Ore (tonnes)* | *Copper (%)* | *Silver (g/tonne)* | *Gold (g/tonne)* |
|---|---|---|---|---|
| PROVED ORE | | | | |
| Prince Lyell 30 Series | 2 720 000 | 1·54 | 3·0 | 0·4 |
| Cape Horn | 550 000 | 2·24 | 3·4 | 0·6 |
| 'A' Lens 30 Series | 410 000 | 1·56 | 1·5 | 0·2 |
| Royal Tharsis 20 & 30 Series | 660 000 | 2·01 | 1·5 | 0·2 |
| TOTAL | 4 340 000 | 1·71 | 2·7 | 0·37 |
| PROBABLE ORE | | | | |
| Prince Lyell 40 Series | 4 830 000 | 1·67 | 3·0 | 0·4 |
| Prince Lyell 50 Series | 4 200 000 | 1·60 | 3·0 | 0·4 |
| Prince Lyell 60 Series | 3 800 000 | 1·70 | 3·0 | 0·4 |
| 'A' Lens 40 Series | 270 000 | 1·50 | 1·5 | 0·2 |
| Western Tharsis 30 & 40 Series | 990 000 | 1·72 | 1·5 | 0·3 |
| North Lyell | 120 000 | 3·50 | 30·0 | 0·5 |
| TOTAL | 14 210 000 | 1·67 | 3·1 | 0·40 |
| TOTAL RESERVES | 18 550 000 | 1·68 | 3·0 | 0·39 |

A substantial revision of ore reserves has occurred as a result of defining higher grade mining outlines. Consequently, a large tonnage of mineralised material previously reported as proved or probable ore has been taken out of reserves and is now classified as possible ore-low grade.

Prince Lyell 20 Series reserves were exhausted during the year 'A' Lens 20 Series reserves have been deleted as a result of the ore now being unmineable. Crown 12 West Reserves were considered to have been exhausted at year end.

Projections from exposures of ore by development and diamond drilling indicate the existence of ' Possible Ore ', as follows:—

| *Mine* | *Ore (tonnes)* | *Copper (%)* | *Silver (g/tonne)* | *Gold (g/tonne)* |
|---|---|---|---|---|
| POSSIBLE HIGH GRADE ORE (NOT RESERVES) | | | | |
| Prince Lyell 70/80/90 Series .... .... | 10 000 000 | 1·7 | 3·0 | 0·4 |
| 'A' Lens 50 Series .... .... .... .... | 200 000 | 1·5 | 1·5 | 0·2 |
| Western Tharsis 50 & 60 Series .... | 1 000 000 | 1·8 | 1·5 | 0·3 |
| Cape Horn .... .... .... .... .... .... | 200 000 | 1·3 | 3·0 | 0·4 |
| North Lyell .... .... .... .... .... .... | 100 000 | 2·0 | 8·0 | 0·1 |
| Crown 3 Pillars .... .... .... .... .... | 1 200 000 | 1·6 | 4·0 | 0·4 |
| Lyell Comstock .... .... .... .... .... | 300 000 | 1·5 | 3·5 | 0·5 |
| TOTAL .... .... .... .... .... .... | 13 000 000 | 1·71 | 3·0 | 0·39 |
| POSSIBLE LOW GRADE ORE (NOT RESERVES) | | | | |
| TOTAL .... .... .... .... .... .... | 21 000 000 | 0·99 | .... | .... |

## MILLING

There was no significant change made to metallurgical plant. The grinding plant operated for only 4 900 hours during the year, instead of a normal 6 000 hours, due to the mine closures which occurred. The Skega rubber lining in the primary ball mill continued to perform satisfactorily and is now expected to have a useful life of approximately 11 000 hours.

Copper recovery in the flotation section was higher than in 1981–1982 due to a more favourable copper to pyrite ratio in the ore treated this year. However, recovery was adversely affected in the last quarter of the year by the presence in the feed of surface-weathered ore from North Lyell.

A filter aid was employed throughout the year to keep filter-cake moisture at an acceptable level. 'Aerodri 100 ' and ' Nopcowet 1186A' have both proven satisfactory for this duty.

## CAPITAL EXPENDITURE

Expenditure on capital items was as follows:—

| | $ | $ |
|---|---|---|
| Plant Items — | | |
| Underground trackless equipment .... .... .... .... | 380 000 | |
| Vehicle replacements .... .... .... .... .... .... .... | 35 000 | |
| Miscellaneous .... .... .... .... .... .... .... .... .... | 187 000 | |
| | | 602 000 |
| Underground Installations .... .... .... .... .... .... .... | .... | 133 000 |
| Mine Development — | | |
| Southern Exhaust Airway .... .... .... .... .... .... | 4 000 | |
| Main Decline extension .... .... .... .... .... .... .... | 463 000 | |
| No. 1 Shaft pump station .... .... .... .... .... .... | 843 000 | |
| | | 1 310 000 |
| Total .... .... .... .... .... .... .... .... .... .... .... | .... | $2 045 000 |

Major items of plant purchased comprised one DJB D550 truck and one Diamec 260 diamond-drill rig. The truck was the sixth DJB D550 to be included in the mine haulage fleet.

An Atlas Copco Simba H221 hydraulic drilling rig was introduced late in the year to undertake undercut-hole drilling but expenditure on this machine is not included in the above figures.

Underground installations comprise the South hangingwall feeder, the installation of which was completed, and the South footwall feeder which is in process.

## MANPOWER

The average number of persons employed including contractors' personnel was 714.

## CLEVELAND TIN, LUINA

This company, reviewed under Tin, produced 1 955 tonnes of copper concentrates containing 446 tonnes of copper valued at $751 194.

## ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This company, reviewed under Zinc, produced 1 566 tonnes of copper valued at $2 657 160.

## GOLD

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Kilograms* | *Value $* | *Year* | *Kilograms* | *Value $* |
|---|---|---|---|---|---|
| 1880 to 1978 .... .... .... | 100 541 | 76 962 812 | 1980–1981 .... .... .... .... | 1 248 | 18 836 569 |
| 1979 .... .... .... .... .... | 1 490 | 13 884 521 | 1981–1982 .... .... .... .... | 1 676 | 18 867 913 |
| 1980* .... .... .... .... .... | 641 | 10 873 565 | 1982–1983 .... .... .... .... | 1 561 | 23 131 955 |
| | | | Total .... .... .... .... | 107 157 | $162 557 335 |

* January to June.

## THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED, QUEENSTOWN

This company recovered 405 kilograms from sludge in the electrolytic copper refinery valued at $6 024 842.

## ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

Concentrates produced by this company contained 1 156 kilograms valued at $17 106 325.

## GOLD FIELDS EXPLORATION PTY LTD

The Company is carrying out an exploration drilling programme from surface at Beaconsfield to delineate any extension at depth of the old Tasmania Mine ore.

After completion of the drilling programme the Company will have earned an option to share in any future development of the mine in partnership with Amax Australia Ltd and Allstate.

No further work was carried out in the Hart Shaft other than to keep it de-watered to 55 metres below the shaft collar.

## LISLE GOLDFIELD

A total of 178·2 grams of gold was reported as having been recovered from lease 35M/71.

Small scale prospecting was carried out by other lease holders on the goldfield.

## LEFROY AND MATHINNA GOLDFIELDS

Only prospecting was carried out over a portion of Consolidated Mineral Lease 97M/80 held in the name of V. Rautner.

## ENDURANCE MINE, SOUTH MT CAMERON

A total of 486 grams of gold was recovered from the amalgam plates purchased by Mr R. Lawry at the mine plant and equipment sale.

## IRON ORE (PELLETS)

### SAVAGE RIVER MINES, SAVAGE RIVER AND PORT LATTA

| *Production* | *Tonnes* |
|---|---|
| Savage River — | |
| All material | 13 170 002 |
| Rock to waste | 7 739 600 |
| Crude ore | 5 430 402 |
| Concentrate produced | 2 287 987 |
| Concentrate pumped | 2 289 003 |
| Port Latta — | |
| Pellets produced | 2 294 344 |
| Pellets shipped | 2 159 804 |
| Pellet inventory | 266 901 |
| Concentrate sold | 15 342 |
| Local pellet sales | 1 327 |

A. S. Christianson, Mining Engineer, Burnie reports —

A shutdown for nine days during June affected production

The production schedule has been reduced to 80 per cent for the mine's current financial year (April 1983–March 1984) to meet the lower consumer demand.

#### MINING

The bulk of the ore produced during the year was obtained by the mining of the east wall second slice in the Central Deposit pit. This progressed to the 18th lift on the south end and varied between the 15th and 16th lifts at the north end. The pit floor is at the 19th lift in the north end and at the 18th lift in the south end.

Mining of the Northern Deposit started in December and by the end of June had reached the 3rd lift. The ore extraction rate by the end of the period accounted for approximately one third of the concentrating plant feed rate.

The south-east and centre-east areas in the Central Deposit were de-watered by more intensive drilling than had been practised previously, from the 16th lift into known fault zones. The north-east corner was de-watered from the 14th lift. Drainhole drilling was carried out on the Northern Deposit to stabilise slopes adjacent to the haul road.

The North Slide area was unloaded down to the 14th lift by means of bulldozers and the area above the rock buttress on the 11th lift in the north-east corner was reformed to promote drainage and stability. Failure of the buttress occurred in June and remedial measures are being assessed. Pit monitoring was carried out regularly with more frequent and intensive monitoring of the potentially unstable areas.

Improvements to permanent drains by the application of cement grout, continued.

Construction work of the Main Creek tailings dam-waste rock dump and associated projects, continued. With the completion of the coffer dam wall, tailings were diverted to discharge into the coffer dam. The relocation of the mine access road and the establishment of a new sewage plant were near completion at the end of the period.

The extent to which ore reserves were increased remained uncertain relative to the long term iron ore market situation.

### Milling

Several improvements were carried out in the concentrating plant to reduce maintenance costs and improve plant availability. A power conservation programme resulted in a reduction in both total consumption and peak demand.

A corrosion rectification programme was carried out on the slurry pipeline between Savage River and Port Latta.

Testing on one furnace line to determine an optimum rate of coal addition as a partial heavy fuel-oil substitute was concluded and the higher rate extended to the other lines.

Engineering in connection with the utilisation of waste heat from the top gas scrubber system to boost the filter feed pulp temperature, is at an advanced stage.

A feasibility study into computer control of the vertical shaft furnaces is being conducted on one furnace to justify a change in operating strategy.

A considerable reduction in concentrate losses to the clarification basin was achieved by upgrading the concentrate thickener feedwells and the filter barometric legs.

A new concrete pad was installed under the concentrate stackout conveyor along with a reclaim sump for this material in order to reduce the amount of tramp material entering the process streams.

Pellets were shipped on 26 vessels averaging 83 069 tonnes per shipment. Two shipments of furnace oil, totalling 27 020 tonnes, were received and 18 284 tonnes of bentonite were imported in two shipments.

### Capital Expenditure

The main areas of capital and major expenditure were —

*Savage River* —

Northern deposit development.
Purchase of new grader, rubber-tyred dozer and water tanker.
Slope de-watering and stabilisation.
Main Creek dam development.
Plant corrosion control.
Townsite maintenance.

*Port Latta* —

The top gas floor of the pellet plant was updated and redesigned to reduce water spillage to adjacent lower floors.

Structural steel and corrosion protection programmes continued for the maintenance of major assets.

### Employment

The workforce was reduced in line with the production schedule. At the end of June 1983 there were 44 fewer employees than at the end of June 1982.

## IRON OXIDE

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 253 155 | 1 214 042 | 1980–1981 .... .... .... .... | 20 600 | 211 210 |
| 1979 .... .... .... .... .... | 16 246 | 154 660 | 1981–1982 .... .... .... .... | 25 490 | 272 000 |
| 1980* .... .... .... .... .... | 8 400 | 84 000 | 1982–1983 .... .... .... .... | 13 570 | 156 600 |
| | | | Total .... .... .... .... | 337 461 | $2 092 512 |

* January to June.

A. Pearson continued to mine hematite at the Iron Cliffs mine, and supplied a cement works with 13 570 tonnes of hematite valued at $156 600.

## LEAD

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 545 379 | 103 277 418 | 1980–1981 .... .... .... .... | 12 710 | 8 536 777 |
| 1979 .... .... .... .... .... | 16 375 | 17 140 828 | 1981–1982 .... .... .... .... | 23 976 | 15 798 934 |
| 1980* .... .... .... .... .... | 7 217 | 6 867 850 | 1982–1983 .... .... .... .... | 27 123 | 16 273 800 |
| | | | Total .... .... .... .... .... | 632 780 | $167 895 607 |

* January to June.

### ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, ROSEBERY

This company, reviewed under Zinc, produced 36 737 tonnes of lead concentrates and the total content of lead in the lead, zinc and copper concentrates was 27 123 tonnes.

### Specimens of Lead Minerals

### ADELAIDE MINE, DUNDAS

Production of mineral samples of crocoite realised $5 602 with stock on hand being valued at $15 000. Underhand stoping was continued on good grade specimen material, by the leaseholder and an employee. Demand for samples eased considerably with few sales of the top grade specimens.

### RED LEAD AREA

Production of specimen crocoite was valued at $21 000, with good sales of the lower grade specimens used for educational purposes. Two men worked the lease and during the year deepened the open-cut by 3 metres. Similar quality crocoite remains to be mined in the current faces.

## MANGANESE DIOXIDE

This is recovered as a sludge in the electrolysis of zinc sulphate at the Risdon Works of the Electrolytic Zinc Company of Australasia Limited, the original source being the ore from its West Coast mines. The production of 136 tonnes was valued at $3 450.

## MERCURY

This is recovered at the Risdon Works of the Electrolytic Zinc Company of Australasia Limited from the roaster gases in the calcining of zinc concentrates. The ore containing the mercury is mined at the company's mine on the West Coast. Recovery was first made early in 1967. Total production to date is 7 697 kilograms valued at $90 251.

## MOLYBDENUM

The King Island Scheelite mine produces a molybdenum concentrate as a by-product of the artificial scheelite plant. A total of 47·03 tonnes of molybdenum concentrate was produced.

## OSMIRIDIUM

Total production to date is 881 kilograms valued at $1 418 771.

## PYRITE

Total production to date is 3 649 045 tonnes.

No value is reported for pyrite as this is now included in the value reported for sulphur as sulphuric acid.

## SILICA FOR SILICON ALLOY PRODUCTION

### THE BROKEN HILL PTY COMPANY LIMITED, BEACONSFIELD

This company mined and supplied to the Tasmanian Electro-Metallurgical Company 22 347 tonnes of silica valued at $558 675.

## SILICON

### TASMANIAN ELECTRO-METALLURGICAL COMPANY PTY LIMITED, BELL BAY

In the production of silicon as silico-manganese this company smelted 16 870 tonnes of local Beaconsfield quartzite combined with slag from ferro-manganese production for a yield of 26 543 tonnes of silico-manganese valued at $12 382 509. The average number of persons employed is shown under Ferro-Manganese.

## SILVER

Silver is produced solely as a by-product from the treatment of copper, lead, zinc and tin ores. A total of 68 874 kilograms of silver was produced for a value of $24 218 368 at the West Coast mines of the Electrolytic Zinc Company of Australasia Ltd, Rosebery and at the Mt Lyell Mining and Railway Co. Ltd, Queenstown. Some of the silver produced by the Electrolytic Zinc Company at Rosebery comes from the ore of Que River Mining Pty Ltd.

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Kilograms* | *Value $* | *Year* | *Kilograms* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 2 149 979 | 85 461 813 | 1980–1981 .... .... .... .... | 36 214 | 15 417 902 |
| 1979 .... .... .... .... .... | 62 705 | 18 657 637 | 1981–1982 .... .... .... .... | 71 232 | 16 654 659 |
| 1980* .... .... .... .... .... | 27 227 | 19 979 634 | 1982–1983 .... .... .... .... | 68 874 | 24 218 368 |
| | | | Total .... .... .... .... | 2 416 231 | $180 390 013 |

* January to June.

## SULPHUR

Sulphuric Acid is produced in the roasting of the zinc concentrates from the West Coast mines of the Electrolytic Zinc Company of Australasia Limited at their Risdon plant.

SULPHUR AS SULPHURIC ACID: SOURCE, QUANTITY AND VALUE OF PRODUCTION

| | *From zinc concentrates* | | *From pyrite concentrates* | | | *Totals* | |
|---|---|---|---|---|---|---|---|
| | | | *Pyrite* | *Acid* | | | |
| *Year* | *Mono tonnes* | *$* | *Tonnes* | *Mono tonnes* | *$* | *Mono tonnes* | *$* |
| 1957–1978 .... .... .... .... .... | 1 290 961 | 19 373 353 | 1 862 449 | 2 630 089 | 51 139 027 | 3 921 050 | 70 512 380 |
| 1979 .... .... .... .... .... .... | 87 695 | 2 025 134 | 41 018 | 101 932 | 2 962 946 | 189 627 | 4 988 080 |
| 1980* .... .... .... .... .... .... | 53 510 | 1 004 383 | Production ceased | | | 53 510 | 1 004 383 |
| 1980–1981 .... .... .... .... .... | 56 820 | 1 345 666 | .... | .... | .... | 56 820 | 1 345 666 |
| 1981–1982 .... .... .... .... .... | 120 660 | 4 360 993 | .... | .... | .... | 120 660 | 4 360 993 |
| 1982–1983 .... .... .... .... .... | 120 267 | 5 206 187 | .... | .... | .... | 120 267 | 5 206 187 |
| Totals .... .... .... .... .... | 1 729 913 | $33 315 716 | 1 903 467 | 2 732 021 | $54 101 973 | 4 461 934 | $87 417 689 |

* January to June.

## TIN

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| 1873–1978 .... .... .... .... | 218 934 | 456 214 272 | 1980–1981 .... .... .... .... | 7 027 | 92 826 175 |
| 1979 .... .... .... .... .... | 6 617 | 94 511 996 | 1981–1982 .... .... .... .... | 6 981 | 98 834 194 |
| 1980* .... .... .... .... .... | 3 282 | 52 867 430 | 1982–1983 .... .... .... .... | 6 477 | 97 458 044 |
| | | | Total .... .... .... .... | 249 327 | $89 271 211 |

* January to June.

### ABERFOYLE EXPLORATION PTY LTD, ZEEHAN DEPOSITS

Work continued on the Queen Hill Consolidated Lease 36M/81 during the year, with a bulk sample being extracted from the Queen Hill No. 2 adit. Test work on this sample from the Queen Hill Upper Zone was carried out in Burnie by Central Metallurgical Services. No diamond drilling was undertaken, but down-hole E.M. surveys were conducted on four of the holes. Reports have been prepared on all the metallurgical test work and the structural geology, with a complete set of geological cross and longitudinal sections produced at a scale of 1:1 000.

The inground resource estimate for the Zeehan deposits is 7·3 million tonnes at 0·7 per cent Sn, which may contain 3·5 million tonnes of 1·2 per cent Sn in continuous higher grade zones. The mineralisation occurs in three separate bodies, the largest being open at a depth of 425 metres below the surface. In spite of the unfavourable market conditions and tin quota imposts, Aberfoyle are conducting a feasibility study into the development of these deposits, and the possible integration of Aberfoyle's matte fuming technology into the milling operation.

### TRIAKO MINES N.L.

All mining operations at the Endurance and Pioneer mines were permanently closed down and all mining equipment and plant was sold for removal from the site.

### BALFOUR FIELD

#### Balfour Tin Mines

P. Laan treated 11 500 cubic metres to produce 10·9 tonnes of concentrate grading 68 per cent Sn. Four persons were employed on the leases during the year. Several items of new plant, including jigs and cyclones were purchased in order to establish a new enlarged treatment plant when market quotas are removed.

#### S. Tatlow

This underground operation produced 150 tonnes which, when treated, yielded 4 tonnes of concentrate grading from 40–76 per cent Sn. Four men were employed on the leases during the year. Additions to the small plant included a Holman table and a 5-cubic yard tip truck.

## CLEVELAND TIN LIMITED, LUINA

A. S. Christianson, Mining Engineer, Burnie reports —

### MINING

### Production

| | *Tonnes* |
|---|---|
| Ore hauled | 314 404 |
| Low grade material hauled | 33 720 |
| Waste hauled | 88 589 |
| TOTAL | 436 713 |

Since March 1982 all rock extracted from stopes has been constantly assessed and classified as mill feed ore, low grade material or waste. The low grade material, which contains, on average, approximately 0·28 per cent tin as cassiterite, has been stockpiled on surface for possible future treatment.

The distribution of ore by source was —

| | *%* |
|---|---|
| Hall's lenses | 48 |
| Henry's lenses | 44 |
| Khaki lenses | 8 |

Development ore accounted for approximately 10 per cent of the total ore hauled.

A total of 239 305 tonnes of ore was broken. Drilled reserves were reduced from 424 604 tonnes to 85 800 tonnes. Blasthole drilling for ore extraction amounted to 38 713 metres.

### Development

Development achieved for the year was as follows:—

| *Development type* | *Metres advanced* |
|---|---|
| Declining | 220 |
| Lateral development | 1 274 |
| Raising | 433 |
| Surface stripping | 163 |
| TOTAL | 2 090 |

A reduction in the total advance in development headings as compared with that of the previous year was due to a shutdown of the mine for six weeks over the Christmas period.

The Main Decline was not advanced during the year and the advanced reflected against ' declining ' was that achieved in access declines to various lens horizons.

Development for surface extraction of the Henry's crown pillar was started. All bench access roads were completed.

### Ore Reserves

The mineable ore reserves declared as at 31 May 1983 were 1 200 000 tonnes at 0·77 per cent tin as cassiterite and 0·31 per cent copper.

**Diamond Drilling and Exploration**

Diamond drilling activity was at a slightly higher rate than that for the previous year and amounted to the following:—

| *Purpose* | *Metres drilled* |
|---|---|
| Production assistance drilling .... .... .... .... | 8 073 |
| Underground exploration drilling .... .... .... | 2 106 |
| TOTAL .... .... .... .... .... .... .... .... | 10 179 |

Production assistance drilling, mainly for Hall's lenses from 17, 18 and 19 levels and for the Upper Battery lenses from the surface, 11 and 15 levels, continued.

Underground exploration drilling was mostly concentrate on outlining indicated resources above 32 level in the Foley wolfram-molybdenum zone in the deep central footwall.

Surface activity was centred on the exploration of a Razorback type of deposit on the ultrabasic contact on the western flanks of Crescent Spur and on initial gridding over the Foley photolineament to the east of the mine.

**Milling**

| | |
|---|---|
| Ore treated (tonnes) .... .... .... .... .... .... | 278 604 |
| Head grade (% Sn) .... .... .... .... .... .... | 0·73 |
| (% Cu) .... .... .... .... .... .... | 0·27 |
| Recovery (% Sn) .... .... .... .... .... .... | 63·7 |
| (% Cu) .... .... .... .... .... .... | 57·7 |
| Tin concentrates produced (tonnes) .... .... | 2 708 |
| Tin content (tonnes) .... .... .... .... | 1 319 |
| Copper concentrate produced (tonnes) .... .... | 1 955 |
| Copper content (tonnes) .... .... .... .... | 446·4 |

Considerably less ore was treated than during the previous year (412 810 tonnes) due to the six week shutdown over Christmas, to limit tin production, and to a reduced feed rate. The lower feed rate to the heavy media separation circuit was a consequence of a considerably improved head grade with respect to tin (0·73 per cent against 0·54 per cent for 1981–1982) and resulted in improved milling efficiencies, particularly in the heavy media separation circuit. Tin recovery improved slightly from 62·4 per cent during the previous year to 63·7 per cent.

Copper recovery at 57·7 per cent was slightly lower than that achieved during the previous year (58·3 per cent). The percentage copper contained in the feed (0·27 per cent) was similar to that of 1981–1982 (0·26 per cent).

No major expenditure was incurred in the mill.

Investigations into the economic viabilities of establishing a matte fuming plant and of possible modifications to provide finer grinding, continued.

**Employment**

The average number of persons employed, by Departments, was as follows:—

| | |
|---|---|
| Staff-all departments .... .... .... .... .... | 61 |
| Award — | |
| Mining .... .... .... .... .... .... .... | 36 |
| Milling .... .... .... .... .... .... .... | 42 |
| Engineering .... .... .... .... .... .... | 73 |
| Other .... .... .... .... .... .... .... .... | 15 |
| TOTAL .... .... .... .... .... .... .... | 227 |

**Capital Expenditure**

Expenditure on capital items during the year was as follows:—

| | $ |
|---|---|
| Replacements (net of disposals) .... .... .... | 51 800 |
| Increasing/maintaining production .... .... | 158 000 |
| Welfare/environment/safety .... .... .... .... | .... |
| Exploration .... .... .... .... .... .... .... | 216 700 |
| TOTAL .... .... .... .... .... .... .... .... | $426 500 |

## CONSOLIDATED EASTERN TIN, COLES BAY

No production for the period was reported and no quotas have been allocated for this mine. The plant remained set up ready for production when quotas are lifted.

## MINOPS PTY LTD AND APOLLO INTERNATIONAL MINERALS N.L.

### ST DIZIER TIN PROSPECT

The joint ventures continued their exploration work at St Dizier under the management of Renison Goldfields Consolidated. Two diamond drill holes of a total depth of 726·8 metres were bored in the skarn horizon, located in sediments near the contact with the Heemskirk granite. In an attempt to increase the 'indicated' reserves, further drilling is to be undertaken in the coming year. Exploitation of this prospect, due to the complexity of the tin mineralogy, will ultimately depend upon the avialability or provision of a tin 'fuming' recovery plant.

Expenditure for the year was $83 033 with resource reserves remaining at 5 million tonnes grading 0·5 per cent Sn.

### RAZORBACK MINE

No field work was undertaken by the joint venturers, but a reinterpretation of past exploration findings has indicated potential future drilling targets.

### GODKIN TIN PROSPECT

Expenditure on this lease was $67 752. Another diamond drill hole was bored to 305·2 metres. A review of all exploration data has indicated a potential in situ geological reserve of 300 000 tonnes of ore containing 0·9 per cent tin. Further diamond drilling is planned for 1983–1984.

### GRAND PRIZE MINE

The Managers (R. G. C.) report that three diamond drill holes were bored for a total length of 1 200 metres. A grid was layed down over the E.L. and M.L.'s for a programme of geophysical and geochemical work to be carried out this coming summer. Further drilling is also planned for this year. No assessment has yet been made of possible reserves.

## NORTH HEEMSKIRK FIELD

R. S. Laffer treated 9 327 cubic metres to produce 5 tonnes of 65 per cent concentrate. This production was achieved in the last eight months of the year, work in the first four months having been directed to the rehabilitation of abandoned leases and construction of the new plant. The plant was run only two days a week because of production quota restrictions. Three men were employed on the leases throughout the year.

## RENISON LIMITED

T. E. Evans, Mining Engineer, Burnie reports —

### PRODUCTION

A total of 665 437 tonnes of ore were mined, the sources of which were as follows:—

| *Orebody* | *Tonnes* |
|---|---|
| Penzance | 135 489 |
| Colebrook | 103 070 |
| Melba | 76 911 |
| South Stebbins | 70 121 |
| North Stebbins | 69 313 |
| Ring | 67 224 |
| Dreadnought | 44 535 |
| Howard | 33 235 |
| Argent | 27 967 |
| Federal | 23 877 |
| Murchison | 1 952 |
| Sundry places | 1 743 |
| | 655 437 |

CONCENTRATOR PLANT

| | |
|---|---|
| Ore treated (tonnes) | 623 204 |
| Ore grade(% Sn) | 1·12 |
| Concentrate produced (net dry tonnes) | 9 991 |
| Tin metal in concentrate (tonnes) | 5 078 |
| Overall metal recovery (%) | 73 |

Tin export quotas were imposed upon Renison for most of the year and production was accordingly limited. A four-week mine shutdown starting just before Christmas was one of the means used to restrain production.

Virtually all the ore produced came from stoping. This was carried out entirely by mechanised cut-and-fill mining, in which the backfilling was either development waste rock or reject material from heavy media separation.

Two new stopes were brought into production, one on the South Stebbins orebody and one on the North Stebbins orebody. The South Stebbins stope, which was silled out at the 1950 horizon, encountered weak ground and mining of the first lift was carried out under a stope back fully supported by cable dowels fifteen metres long. The North Stebbins stope was silled out at the 1820 horizon and, although currently being mined by the cut-and-fill method, will, after reaching the 1840 horizon, become a longhole open stope.

Mining of the two stopes opened up on the Federal orebody was suspended for most of the year as one of the measures taken to limit the overall production.

### MINE DEVELOPMENT

As another consequence of the tin-quota imposition, a number of miners were transferred from production to development work, thus raising the level of lateral development above that of the previous year.

The areas of greatest lateral-development were North Bassett, Ring 4, Argent and the No. 3 Decline system. North Bassett development included an extension to the hangingwall exploration drive and a crosscut to a new ventilation raise system. Ring 4 and Argent development chiefly comprised accessways to the ore zones and sill drives while development associated with the No. 3 Decline comprised accessways to, and sill drives on, the North Stebbins and South stebbins orebodies.

In addition, development of the Renison Decline continued, though at slow pace. A clear-water sump was excavated off the Renison Decline and is now in use in conjunction with the 1700 Pump Station.

Contract raise development by means of raise borer was introduced and at years end one raise, the 5D, had been completed and another one, the 7A, had been started. Each raise is part of a system ventilating the North Bassett. The 7A Raise holes to surface.

The Alimak raise crews employed by the mine worked exclusively on developing stope raises.

Mine development achieved during the period was as follows:—

| | *Ore (m)* | *Waste (m)* | *Total (m)* |
|---|---|---|---|
| *Driving and cross-cutting —* | | | |
| Renison mine | .... | 223·3 | 223·3 |
| North Bassett | .... | 332·9 | 332·9 |
| North Stebbins | 48·2 | 103·8 | 152·0 |
| South Stebbins | 238·1 | 536·0 | 774·1 |
| Murchison | 15·7 | 118·5 | 134·2 |
| Dreadnought | 155·5 | 338·8 | 494·3 |
| Penzance | 2·8 | 112·3 | 115·1 |
| Howard | 8·0 | 148·6 | 156·6 |
| Ring | 250·6 | 475·6 | 762·2 |
| Argent | 130·5 | 665·6 | 769·1 |
| | 849·4 | 3 055·4 | 3 904·8 |
| *Raising* | | | |
| Alimak developed | 101·9 | 140·3 | 242·2 |
| Raise bored | .... | 134·2 | 134·2 |
| | 101·9 | 274·5 | 376·4 |

## Milling

To limit tin production to a level in line with the quotas, the concentrator was shut down for four weeks over Christmas and five-day week operating which started at the end of April was still in force at the end of the period.

Substracting the lost time from the possible operating time, overall plant availability was 81·9 per cent, which is higher by 3·3 per cent than the previous year.

The treatment rate which was considerably higher than in previous years, at one time reached the expanded design capacity. It is believed that modifications made to the crushing and grinding circuits are chiefly responsible for this.

The metallurgical performance of the plant was satisfactory, with record concentrate grade and tin recovery achieved. Better leaching efficiency was responsible for the grade improvement, while the effectiveness of modifications made to the treatment circuits, together with better operation, brought about the higher recovery.

Research continued into treatment-circuit analysis and improvement. Progress was made in the field of computer control of the grinding and flotation circuits.

## Exploration — Mine Lease

Intensive drilling was carried out in the immediate vicinity of the mine aimed at improving the definition of already known ore and adding to ore reserves. This drilling was undertaken from both surface and underground sites.

In addition, a drilling programme on a broad grid was commenced in the southern portion of the lease aimed at locating continuation of Renison-type mineralisation at depth. This programme is likely to be carried on for several years.

## Ore Reserves

Although additional reserves of ore were defined during the year, production outstripped replacement of ore and the level of ore reserves fell.

Details of the ore reserves as at June 1983 are as follows:—

| | *Proved* | | *Probable* | | *Total* | |
|---|---|---|---|---|---|---|
| *Ore Type* | *Tonnes 000's* | *Grade % Sn* | *Tonnes 000's* | *Grade % Sn* | *Tonnes 000's* | *Grade % Sn* |
| Stratabound | 2 805 | 1·4 | 4 152 | 1·1 | 6 957 | 1·3 |
| Stratabound/Fault | 241 | 1·1 | 3 175 | 1·1 | 3 416 | 1·1 |
| Fault | 1 648 | 0·8 | 4 250 | 0·8 | 5 989 | 0·8 |
| Fracture (Melba) | 438 | 1·1 | .... | .... | 438 | 1·1 |
| Totals | 5 132 | 1·2 | 11 577 | 1·0 | 16 709 | 1·1 |

## Capital Expenditure

Over the period from 1 July 1982 to 30 June 1983 expenditure on capital items was as follows:—

| | $ |
|---|---|
| Community projects | 375 021 |
| Lease buildings and services | 452 408 |
| Underground equipment | 806 279 |
| Mill plant and equipment | 335 133 |
| Instruments, laboratory and workshop equipment | 82 404 |
| Office equipment | 673 614 |
| Motor vehicles | 239 318 |
| Mobile equipment | 989 469 |
| Mine development | 871 072 |
| | $4 825 718 |

## Community Projects

The seven new houses at Zeehan, started last year, were completed. Additionally, a programme of sealing home driveways was undertaken.

## Lease Buildings and Services

Extension to the tailings dam was responsible for 84 per cent of the expenditure under this heading while provision of additional amenities at the Bulk Store accounted for nearly 5 per cent.

## Underground Equipment

Establishment of the 11 kV underground power-distribution system was completed and accounted for $655 346 of the amount spent under this heading. Completion of the No. 8 upcast ventilation system accounted for a further $56 031. A third pump was installed in the 1700 pump station and a second rising main was installed between that pump station and the 1950 pump station.

## Mill Plant and Equipment

The bulk of the expenditure under this heading was for —

| | $ |
|---|---|
| Fox 3 process computer | 32 772 |
| Pinion gear for the ball mill | 22 134 |
| Pump upgrading | 165 433 |
| Sump-level controller | 26 120 |

## Instruments, Laboratory and Workshop Equipment

A sludge analyser was purchased costing $32 500 and several minor items of equipment were replaced.

## Office Equipment

Two Prime 550 computers were purchased, costing, together with ancillary equipment $655 917.

## Motor Vehicles

All the sum shown against this heading was for replacements.

### Mobile Equipment

Another Caterpillar 769C truck, a Caterpillar 988 front-end loader and Caterpillar 925-mounted scaling platform were purchased.

### Manpower

At 30 June 1983 the workforce, including staff and award workers, stood as follows:—

| | |
|---|---|
| Mining | 117 |
| Metallurgical | 134 |
| Engineering | 174 |
| Administration | 45 |
| Geology | 12 |
| Employee relations | 22 |
| Total | 504 |

Turnover during the year for permanent award workers amounted to 15·6 per cent, which was the lowest turnover ever recorded by Renison Limited.

## ROSSARDEN MINES LTD, ROSSARDEN

All mining and treatment operations at Rossarden and Storys Creek were permanently closed down early in the year and all plant and equipment was sold for removal from the mine.

## SMALL PRODUCERS

BRANXHOLM - DERBY - RINGAROOMA

| *Name of Producer* | *Tin Concentrates Tonnes* | *Contained Tin Metal Tonnes* | *Value $* |
|---|---|---|---|
| Banks, R. | 0·052 | 0·034 | 491 |
| Banks, K. | 0·216 | 0·105 | 1 571 |
| Barnett, L. M. | 0·572 | 0·411 | 6 046 |
| B. & J. Packett | 0·621 | 0·308 | 4 532 |
| Bendall, M. | 1·080 | 0·702 | 11 894 |
| Betts, H. E. | 0·082 | 0·054 | 786 |
| Dobson, A. | 0·223 | 0·165 | 2 555 |
| Hayes, R. | 0·055 | 0·037 | 531 |
| Johnson, N. | 1·140 | 0·787 | 11 171 |
| Johnson, N. C. & V. A. | 5·005 | 3·333 | 50 509 |
| Jones, E. | 2·325 | 1·637 | 26 419 |
| Kerrison, K. | 3·122 | 2·099 | 31 345 |
| Locsei, L. | 1·026 | 0·614 | 9 883 |
| Mutual Mining | 0·450 | 0·297 | 4 851 |
| Oliver, P. | 0·133 | 0·086 | 1 454 |
| Phildes Mining | 0·323 | 0·191 | 2 717 |
| Quillerat, E. | 0·114 | 0·057 | 813 |
| Reynolds, D. & T. | 1·613 | 1·173 | 17 013 |

PIONEER – SOUTH MT CAMERON – GLADSTONE AREA

| *Name of Producer* | *Tin Concentrates Tonnes* | *Contained Tin Metal Tonnes* | *Value $* |
|---|---|---|---|
| Blackberry, D. M. | 1·226 | 0·858 | 12 200 |
| Bruce, P. | 0·567 | 0·320 | 4 896 |
| Burrows, R. | 0·056 | 0·029 | 415 |
| Cooke, P. | 0·049 | 0·035 | 596 |
| Garfield Mining | 9·655 | 6·351 | 103 187 |
| Kerrison, M. J. | 0·050 | 0·037 | 634 |
| Lawry, D. | 0·098 | 0·070 | 996 |
| Lawry, R. C. | 1·730 | 1·289 | 18 398 |
| LeFevre, P. | 0·052 | 0·040 | 614 |
| Moore, M. | 4·489 | 3·108 | 47 908 |
| Moore, N. | 0·096 | 0·065 | 938 |
| Moore, R. J. | 0·939 | 0·653 | 10 723 |
| Reynolds, M | 1·356 | 0·875 | 12 643 |
| Wood, V. | 4·706 | 3·392 | 51 194 |
| Woods, C. V. | 7·148 | 4·593 | 69 808 |

EAST COAST

| *Name of Producer* | *Tin Concentrates Tonnes* | *Contained Tin Metal Tonnes* | *Value $* |
|---|---|---|---|
| Cox, J. & Symon | 0·153 | 0·106 | 1 525 |
| Dwyer, D. B. | 0·099 | 0·068 | 1 100 |
| Franks, W. | 0·450 | 0·323 | 5 095 |
| Lewis, O. | 0·049 | 0·036 | 603 |
| Reynolds, J. P. | 0·147 | 0·106 | 1 747 |

WEST COAST (BALFOUR – WARATAH – PORT DAVEY)

| *Name of Producer* | *Tin Concentrates Tonnes* | *Contained Tin Metal Tonnes* | *Value $* |
|---|---|---|---|
| Brampton, T. | 0·098 | 0·031 | 475 |
| Glozier, M | 0·040 | 0·027 | 461 |
| Holloway, J. | 0·135 | 0·719 | 11 524 |
| Kenworthy, D. | 0·234 | 0·136 | 2 140 |
| King, C. D. | 1·697 | 1·237 | 17 706 |
| Laan, P. | 12·361 | 8·739 | 136 810 |
| Laffer, R. | 6·130 | 3·798 | 61 215 |
| Machen, Gale and Phillips | 0·199 | 0·108 | 1 776 |
| Smith, A. R. | 0·088 | 0·061 | 984 |
| Whittaker, G. J. | 0·397 | 0·249 | 4 049 |
| Willson, P. R. H. | 5·714 | 4·285 | 63 073 |

## TITANIUM

Titanium as titanium dioxide is reported under Foreign Ores.

## TUNGSTEN (SCHEELITE)

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes (Concentrates)* | *Tonnes ($WO_3$)* | *Value $* |
|---|---|---|---|
| 1917 to 1978 | 46 210 | 14 109 | 179 100 797 |
| 1979 | 3 231 | 2 379 | 29 178 743 |
| 1980 (January to June) | 1 928 | 1 423 | 17 937 884 |
| 1980–1981 | 3 536 | 2 771 | 34 707 138 |
| 1981–1982 | 3 238 | 2 356 | 26 552 010 |
| 1982–1983 | 2 110 | 1 529 | 14 456 513 |
| Total | 60 253 | 24 567 | $301 933 085 |

## KING ISLAND SCHEELITE, GRASSY

PRODUCTION STATISTICS

| | |
|---|---|
| Ore Mined (tonnes) — | |
| Dolphin Mine | 131 478 |
| Bold Head Mine | 72 679 |
| Total | 204 157 |
| Mill throughput (tonnes) | 183 576 |
| Average head grade ($\%WO_3$) | 0·86 |
| Gravity concentrates (tonnes) | 1 210 |
| Artificial scheelite concentrates (tonnes) | 590 |
| Total concentrates (tonnes) | 1 800 |
| Tungstic oxide (MTUs) | 133 732 |
| Concentrate grade ($\%WO_3$) | 74·30 |
| Recovery (%) | 83·13 |
| Molybdenum concentrates (tonnes) | 44·03 |

Number of persons employed as at 30 June 1983 —

| | *Males* | *Females* | *Total* |
|---|---|---|---|
| Surface | 137 | 14 | 151 |
| Underground | 37 | .... | 37 |
| | 174 | 14 | 188 |

R. Billingham, Senior Mining Engineer, Rosny Park reports —

During the year, further falls in the price of tungsten and low sales volumes resulted in additional measures being taken to reduce costs and production. The mine was closed for four weeks during September–October and again for six weeks because of a strike in April–May. The total number of employees was reduced from 332 at the end of 1981–1982 to 188 at the end of 1982–1983 and 131 employees were retrenched. Budget mine production was also reduced from 300 000 to 146 000 tonnes per annum.

## Mining

### Dolphin Mine

Development advances made were —

| | m |
|---|---|
| Decline by-pass | 53 |
| Level drives | 180 |
| Ramps | 80 |
| Raising | 112 |
| Total | 425 |

Development advances were severely restricted because of the production cut-back. The decline by-pass to provide a second vehicle access to the lower stoping areas proceeded slowly. The installation of fully-grouted rockbolts and shotcrete to support development work continued. The main stoping areas were the Lower Wedge open stope and the Lower Pit stope which together accounted for 50 per cent of stope tonnage. Production from the Lower Wedge was severely curtailed as a result of failure of the sidewall and backs in the W62 open stope.

The Rock Mechanics section continued to monitor mine stability particularly in the Lower Wedge area. Following the failure in W62 stope additional geophysical instruments and shear strips were installed to monitor any further collapse. Liaison with CSIRO and independent consultants continued.

### Bold Head Mine

Development advances were —

| | m |
|---|---|
| Level drives | 19 |
| Ramps | 218 |
| Raising | 45 |
| Total | 282 |

Development advances were restricted to access requirements for existing and new ore sources. The CI Lens and the Fault Block accounted for 73 per cent of the ore produced. Hand mining using air legs and cavo loaders continued in A Lens.

## Milling

Mill throughput at 183 576 tonnes was 116 424 tonnes below the original budget figure, mainly because of the mine closures and production changes. Mill availability was 93 per cent. Despite the low rainfall during the year, water supply was not a problem because of the reduction in production. Operational changes were carried out and by the end of the year most of the plant was being worked on a single shift, five day week basis. Overall recovery at 83·13 per cent was considered highly satisfactory considering the interruptions due to stoppages. Recovery in the artificial scheelite plant was 92·29 per cent.

## Mine Maintenance

Mechanical availability, of both mobile and fixed plant was high, emphasising the benefit of planned maintenance.

Energy generation decreased by 39·4 per cent to 22 816 000 kWh, resulting in a higher cost per unit generated. Further overhauls were carried out on the Mirrlees engines.

## TASMINEX N.L., KARA MINE

Mr E. C. Leyland, Senior Mining Engineer, Burnie reports —

### PRODUCTION

| | Tonnes |
|---|---|
| Ore treated | 137 265 |
| Magnetite | 82 000 |

During the twelve month period, production was entirely from the Kara No. 1 orebody in the main pit. Mining continued in the main ore zone but considerable dilution of the ore occurred from previously dumped overburden. All high grade concentrate (69 per cent $WO_3$) was sold and shipped to Europe, with 35·0 tonnes of low grade concentrate (25 per cent $WO_3$) being shipped to Los Angeles, U.S.A. The magnetite was stockpiled pending possible future sale; Goliath Cement Co. of Railton purchased 4 400 tonnes at the end of the year. The demand for scheelite fell to zero with decline in price. The average price received over the twelve months to 30 June 1983 was 31 per cent less than the average over the preceding year.

### EXPLORATION AND RESERVES

McIntyre Mines (Australia) Pty Ltd continued their exploration activities on E.L. 17/68 and Consolidated Mining Lease 105M/77. A total of twenty diamond drill holes were drilled in the L5 area, where a Northern extension of the Eastern Ridge deposit had been located, under some thirty-five metres of Tertiary basalt cover. The drilling programme finished in February and surface exploration to determine potential strike extensions of the L5 skarns was continued. In September 1982 revised geological reserves were given by McIntyre Mines as follows:—

Kara No. 1 — 1 086 721 tonnes at 0·75 per cent $WO_3$
Kara North — 523 040 tonnes at 0·95 per cent $WO_3$.

### CAPITAL EXPENDITURE

The total capital expenditure for the year was $162 000. A new secondary crusher and screen ($38 940) was the major single item.

### MILLING

The three-shift operation continued in the plant concentrator throughout the year. The major improvement to the circuit was the installation of the new crusher ensuring a 19 mm maximum feed size to the ball mill.

### EMPLOYMENT

The total labour force remained at twenty-seven persons of whom twenty-two were directly employed by Tasminex N.L.

## TUNGSTEN (WOLFRAM)

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes (Concentrates)* | *Tonnes ($WO_3$)* | *Value $* |
|---|---|---|---|
| 1899 to 1978 | 21 750 | 2 726 | 43 123 146 |
| 1979 | 1 261 | 111 | 1 362 604 |
| 1980 (January to June) | 88 | 63 | 794 199 |
| 1980–1981 | 475 | 339 | 4 251 171 |
| 1981–1982 | 152 | 110 | 1 259 338 |
| 1982–1983 | 5 | 4 | 37 871 |
| Total | 22 596 | 3 353 | $50 828 329 |

## ZINC

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| 1919 to 1978 | 1 455 020 | 419 733 281 | 1980–1981 | 41 270 | 30 148 419 |
| 1979 | 59 396 | 43 968 329 | 1981–1982 | 65 122 | 55 642 155 |
| 1980* | 26 432 | 19 070 688 | 1982–1983 | 65 363 | 57 161 528 |
| | | | Total | 1 712 603 | $625 724 400 |

* January to June.

## ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED

RISDON: EXTRACTION FROM CONCENTRATES

| | Tonnes |
|---|---|
| From other than Tasmanian ore — | |
| Zinc | 119 233 |
| Cadmium | 445 |
| Cobalt oxide | 21·78 |
| Superphosphate | 76 966 |
| From Tasmanian ore — | |
| Zinc | 65 363 |
| Cadmium | 158 |
| Manufactured products — | |
| Aluminium sulphate | 1 074 |
| Ammonium sulphate | 572 |

WEST COAST DIVISION

| | Tonnes |
|---|---|
| Concentrate produced — | |
| Zinc concentrate | 150 552 |
| Lead concentrate | 36 737 |
| Copper concentrate | 24 969 |
| Recoverable quantity in ore mined — | |
| Zinc | 65 363 |
| Lead | 27 123 |
| Copper | 1 566 |
| Cadmium | 158 |
| Cobalt oxide | 2·395 |
| Silver | 65·892 |
| Gold | 1·156 |
| Manganese dioxide | 136 |

### RISDON WORKS

P. Allan, Mining Engineer, Rosny Park, reports that major developments for the year included —

Completion of the design and construction of plant modifications for the treatment of Elura mine concentrates.

Continuation of design and construction of modifications and additions in the wharf area for the proposed erection of two gantry cranes for material and container handling.

Design and construction of the fibreglass reinforced plastic fabrication of a replacement solution tank.

Continuing investigation into the design and construction of a pilot plant for experimentation with improvement in the purification process.

### WEST COAST MINES

A. S. Christianson, Mining Engineer, Burnie reports —

MINING

Operations during the year were centred on the Rosebery and Hercules mines. Farrell Mine remained on a care and maintenance basis.

## Production

A shortfall against the target and against the previous year's performance was attributable to some extent to industrial disputes.

A substantial reduction in the strength of the workforce without jeopardising the production rate was possible through an increased output from the mechanised bulk stopes and a corresponding lower output from the labour intensive square sett cut and fill stopes at the Rosebery mine. The Mining department labour strength was reduced by 20 per cent during the year.

The main sources of ore from the Hercules mine were the 'A' lode and 'M' lode open-cuts. The balance was development ore from headings between 6 and 7 levels.

Sources of ore —

| | *tonnes* |
|---|---|
| Rosebery underground .... .... .... .... .... | 486 391 |
| Hercules .... .... .... .... .... .... .... .... | 46 327 |
| TOTAL .... .... .... .... .... .... .... .... | 532 718 |

## Development

Development activity at the Rosebery mine was mainly concentrated on requirements for bulk stoping blocks between 15 and 17 levels and the Decline Section below 17 level.

Achievements for the year were —

| | *Lateral development (metres)* | *Raising (metres)* |
|---|---|---|
| Rosebery .... .... .... .... .... .... .... .... | 5 563 | 380 |
| Hercules .... .... .... .... .... .... .... .... | 350 | 290 |
| TOTAL .... .... .... .... .... .... .... .... | 5 913 | 670 |

## Ore Reserves

Ore reserves as at 30 June 1983 were — Rosebery, 6 433 520 tonnes; Hercules, 422 414 tonnes; Farrell, 71 000 tonnes giving a total of 6 926 934 tonnes of ore at 15·6 per cent Zn, 5·0 per cent Pb, 0·76 per cent Cu, 134 grams/tonne Ag, 2·9 grams/tonne Au and 13·3 per cent Fe.

## Diamond Drilling

A total of 8 809 metres of core drilling was achieved for planning purposes and 316 metres were drilled to facilitate the provision of services.

## Milling

Ore to Mill (including ore from the Que River mine for milling) —

| | *Tonnes* | *Zn %* | *Pb %* | *Cu %* | *Ag (g/t)* | *Au (g/t)* |
|---|---|---|---|---|---|---|
| West Coast Mines .... .... .... .... .... .... | 536 880 | 10·5 | 3·7 | 0·6 | 102·3 | 2·7 |
| Que River Mine .... .... .... .... .... .... | 229 474 | 15·0 | 8·4 | 0·5 | 182·9 | 3·6 |
| TOTAL .... .... .... .... .... .... .... .... | 766 354 | 11·9 | 5·1 | 0·6 | 126·4 | 3·0 |

At times problems were experienced with high moisture content of the post-filter concentrates. An investigation into the efficacy of installating pressure filters is in progress.

### Employment

The total labour force was reduced from 1 115 to 880.

The work force was as follows:—

| | |
|---|---|
| Mining | 463 |
| Engineering | 254 |
| Treatment | 76 |
| Other | 87 |
| Total | 880 |

### Capital Expenditure

Items of mining equipment purchased included —

3 HB4KE electric loaders.
1 Tamrock rockbolting rig.
1 Tamrock Solo stope drilling rig.
2 Battery locos.
1 Hydraulic rock breaker.
1 HB620 diesel front end loader.

Additional capital expenditure was incurred in the mill expansion project.

## Exploration

### Mt Black E.L. 1/62

Colebrook Hill: Three diamond drill holes were drilled under magnetic anomalies in the Olympic-Athenic mine area. One of these intersected two zones of weak pyrrhotite. The results from a further three holes located in the area were not available by the end of June.

East Colebrook: Seven grid lines totalling 7·6 kilometres were cut, pegged, soil sampled, surveyed by magnetometer and Genie E.M. and geologically mapped to follow up Dighem E. M. anomalies.

Ring River: Detailed modelling of a magnetic anomaly resulted in the collaring of a diamond drill hole, which had reached a depth of 330 metres by the end of June.

West Murchison: A small grid of 4·5 kilometres cut on seven lines disproved the soil geochemical anomaly reported previously in the area.

### Bulgobac E.L. 12/72

Twelve vertical drill holes through the glacial cover in the Boco area were completed and altered volcanic rocks were intersected in two traverses. Glacial cover was shown to be up to 99 metres deep. Diamond drilling across the zone of alternation had advanced 424·5 metres by year-end.

### Sterling Valley E.L. 4/73

A costean revealed a granitic intrusive with associated thin quartz-sulphide veins, containing arsenic, tin and gold. Systematic channel sampling of the costean showed that the bulk grade of the costeans area was not very significant.

**Montezuma Part E.L. 15/76**

A total of 7.75 kilometres of grid was cut during the year and lines totalling 21·7 kilometres were pegged, soil sampled, surveyed by Genie E.M. and magnetometer and geologically mapped. A diamond drill hole was collared on a coincident tin soil anomaly and E.M. anomaly in the vicinity of a dolomitic conglomerate unit.

**Sandy Cape E.L. 56/80**

A Crone P.E.M. survey was carried out on magnetic anomaly No. 1 grid on seven lines totalling 4·1 kilometres. Two reconnaissance lines were cut, pegged and surveyed by P.E.M. and magnetics on magnetic anomaly No. 2 grid.

**S.P.L. 806**

Subsequent to an assessment of the Department of Mines aeromagnetic survey, geological mapping and stream sediment sampling it was decided to withdraw from the joint venture with Trikon Corporation on S.P.L. 806

**Misery Flat E.L. 51/80**

The Department of Mines aeromagnetic survey over the area was interpreted and assessed and the licence relinquished.

**Smithton E.L. 52/80**

The Exploration Licence was relinquished.

**Zeehan Smelter Leases 60M/77, 4W/77**

Amoco continued to operate on the lease on behalf of the E.Z.–Amoco joint venture. Only minor mineralisation was returned from the diamond drilling programme.

**Read-Rosebery Leases**

Line cutting, pegging and geological mapping of all grids was completed as were the I.P. survey and the ground magnetic survey. At end of the year synthesis of all data was in progress in order to define drilling targets in the Rosebery host rock sequence.

## QUE RIVER MINING PTY LIMITED

T. E. Evans, Mining Engineer, Burnie, Reports —

### Production

During the year, 229 776 tonnes of ore were hoisted up the shaft and 238 731 tonnes were trucked by road to the Rosebery concentrator of the Electrolytic Zinc Company. The difference of 8 955 tonnes was taken from the ore stockpile at Que River, which stood at 12 095 tonnes at year end. The trucking was carried out by contractors.

Stoping, which was carried out by bighole, open-stoping method, was responsible for the production of approximately 65 per cent of the tonnage of ore hoisted. Only primary stopes were mined and these were situated between the 5 and 4 levels in the heart of the orebody and between the 6 and 5 levels and the 7 and 5 levels at the southern extremity. In these stopes, 8 958 metres of bigholes were bored and 142 259 tonnes of ore were broken. Broken ore extraction from the stopes' drawpoints was carried out by diesel-engined Eimco 913 L.H.D. machines.

Completed stopes were backfilled. Fill material consisted of gravel which was obtained from a gravel pit at Tullah operated on behalf of Que River Mines by a contractor. As it was primary stoping that was filled, cement was added at Que River's fill plant before the material was despatched to the stopes by way of fill holes from surface, 1 093·5 metres of which were bored during the year.

### Mine Development

A total of 1 989·9 metres of mine development was achieved during the year, comprising 505·5 metres of decline and 1 484·4 metres of lateral development.

The decline was mined upwards from 5 Level as well as downwards and holed through at end of year. It now provides access for vehicular traffic to all levels of the mine and to the shaft bottom, from the surface.

Most of the other development was on 4 Level, where a footwall drive and drawpoints to the stopes were mined. A chamber to house a diesel workshop was also developed on 4 Level.

A drive was mined on 6 Level from the decline to provide bottom access to fringe ore at the southern end of the orebody.

### Milling

Treatment of the Que River production was carried out to concentrate form at the Rosebery concentrator of the Electrolytic Zinc Company of Australasia Limited

### Diamond Drilling

During the year, 9 814 metres of diamond drilling were completed. Of this, 6 709 metres were drilled to provide production assistance and 3 105 metres were drilled with addition to ore reserves in view.

### Ore Reserves

As at 16 November 1982 Que River ore reserves were reported as 1 900 000 tonnes grading 0·4 per cent copper, 7·5 per cent lead, 13·1 per cent zinc, 190 grammes per tonne silver and 3·5 grammes per tonne gold.

### Exploration

Field exploration undertaken during the year consisted of 14·6 line kilometres of UTEM over M.L. 3M/75 and M.L. 4M/75 as part of a larger programme covering E.L. 2/70 and E.L. 15/73. UTEM is a deep-search electromagnetic technique that is able to locate Que River type mineralisation beyond the limit of penetration of previously employed prospecting methods, viz. geochemistry and induced polarisation geophysics. The data produced by the work were being evaluated at end of the year.

The joint Que River/CSIRO research project on the geology of the Que River deposits continued to be supported. Data resulting from this project have already contributed much to the understanding of the local geology.

### Capital Expenditure

Capital works for the year were —

| | $ |
|---|---|
| Underground .... .... .... .... .... .... .... .... | 4 264 900 |
| Surface .... .... .... .... .... .... .... .... .... | 1 030 800 |
| Town and community .... .... .... .... .... .... | 282 100 |
| Total .... .... .... .... .... .... .... .... .... | $5 577 800 |

Most of the expenditure was on capitalised mine development. Items of underground equipment purchased included an Eimco 913 together with bulldozer and impact rockbreaker attachments. The Waratah housing scheme was completed.

### MANPOWER

At the end of June 1983 the workforce comprised seventy-eight employees of Que River Mining Pty Limited and thirty-four contractors. The Que River employees consisted of thirty-seven staff and forty-one award workers. The contractors were entirely employed on maintenance.

## ZIRCON

There was no production of Zircon during 1982–1983.

# 2. NON-METALLIC MINERALS

## CLAY

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *m³* | *Value $* | *Year* | *m³* | *Value $* |
|---|---|---|---|---|---|
| 1958 to 1978 .... .... .... | 2 179 086 | 6 614 273 | 1980–1981 .... .... .... .... | 88 982 | 444 910 |
| 1979 .... .... .... .... .... | 92 671 | 324 281 | 1981–1982 .... .... .... .... | 103 469 | 571 842 |
| 1980* .... .... .... .... .... | 37 517 | 187 584 | 1982–1983 .... .... .... .... | 78 795 | 374 562 |
| | | | Total .... .... .... .... | 2 580 520 | $8 517 452 |

* January to June.

DETAILS OF PRODUCTION

| *Company* | *Clay m³* | *Value $* | *No. of Persons* | *Product* |
|---|---|---|---|---|
| Clifton Brick (Tas) Pty Ltd, Longford .... .... .... .... .... .... .... | 22 610 | 113 050 | 26 | Bricks |
| Goliath Portland Cement Co., Railton .... .... .... .... .... .... .... | 23 670 | 118 183 | * | Cement |
| Grierson, M. A., Dodges Ferry† .... .... .... .... .... .... .... .... | 4 037 | 20 185 | 1 | Bricks |
| Hazell Bros, Kingston† .... .... .... .... .... .... .... .... .... .... | 8 515 | 44 099 | 1 | Bricks |
| Hobart Brick Co., Granton .... .... .... .... .... .... .... .... .... | 9 669 | 46 275 | 24 | Bricks |
| Hobart Brick Co., Kingston .... .... .... .... .... .... .... .... .... | 163 | 815 | 1 | Bricks |
| Hobart Brick Co., Oyster Cove .... .... .... .... .... .... .... .... | 1 080 | 6 260 | 2 | Bricks |
| Zolati & Sons, Dulverton .... .... .... .... .... .... .... .... .... .... | 5 139 | 25 695 | 18 | Bricks |

* Reported under Limestone.
† Suppliers to Hobart Brick Company.

The market for building bricks was generally depressed during the year.

### CLIFTON BRICK (TAS) PTY LTD, LONGFORD

Alterations costing $110 000 were made to the sawdust drying plant including a new bin and feeder system and an additional heater unit.

### ZOLATI & SONS PTY LTD, DULVERTON

No alterations to plant or equipment were reported.

The workforce increased during the period.

## DOLOMITE

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 92 670 | 701 056 | 1980–1981 .... .... .... .... | 9 872 | 134 247 |
| 1979 .... .... .... .... .... | 18 313 | 216 739 | 1981–1982 .... .... .... .... | 13 632 | 202 497 |
| 1980* .... .... .... .... .... | 8 369 | 99 084 | 1982–1983 .... .... .... .... | 17 755 | 273 889 |
| | | | Total .... .... .... .... | 160 611 | $1 627 512 |

* January to June.

### CIRCULAR HEAD DOLOMITE AND TRADING CO. PTY LTD

This company sold 17 755 tonnes of crushed dolomite, valued at $273 889 and 2 556 cubic metres of dolomite screenings valued at $33 170. Capital expenditure was $9 225 with a further $6 092 outlayed to cover additions to the storage shed. On average ten men were employed.

## KAOLIN

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 148 772 | 4 113 734 | 1980–1981 .... .... .... .... | 22 411 | 1 803 078 |
| 1979 .... .... .... .... .... | 17 513 | 1 454 203 | 1981–1982 .... .... .... .... | 18 424 | 1 650 390 |
| 1980* .... .... .... .... .... | 8 964 | 694 972 | 1982–1983 .... .... .... .... | 14 909 | 1 544 402 |
| | | | Total .... .... .... .... | 230 993 | $11 260 779 |

* January to June.

### A.P.P.M. LTD, TONGANAH

No major alterations were made to plant or equipment during the period except for modifications to some pumps to upgrade their speed and horsepower.

Mining was confined to the No. 3 pit north of the Tasman Highway.

Rehabilitation of mining and tailings areas was adversely affected by the very dry summer and some 8 hectares of tailings will be re-seeded.

The workforce was reduced from seventeen to fifteen during the period under review.

## LIMESTONE

QUANTITY, VALUE OF PRODUCTION AND USAGE

| | *Manufacture of cement* | | *Manufacture of carbide* | | *Chemical and metallurgical* | | *Agricultural and other* | | *Totals* | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Year* | *Tonnes* | *$* | *Tonnes* | *$* | *Tonnes* | *$* | *Tonnes* | *$* | *Tonnes* | *$* |
| To 1978 .... | 10 219 400 | 18 444 217 | 1 009 677 | 4 858 709 | 4 919 720 | 9 385 961 | 1 271 175 | 3 742 736 | 17 419 972 | 36 431 623 |
| 1979 .... .... | 559 564 | 1 678 692 | 29 160 | 437 400 | 88 371 | 904 078 | 70 764 | 415 679 | 747 859 | 3 435 849 |
| 1980* .... | 268 083 | 804 249 | 21 671 | 325 065 | 44 947 | 466 304 | 38 552 | 208 292 | 373 253 | 1 803 910 |
| 1980–1981 | 557 995 | 1 673 985 | 21 001 | 315 015 | 99 509 | 1 053 654 | 62 494 | 388 718 | 740 999 | 3 431 372 |
| 1981–1982 | 667 014 | 2 001 042 | .... | .... | 93 693 | 793 597 | 62 072 | 424 082 | 822 779 | 3 218 721 |
| 1982–1983 | 611 583 | 1 834 749 | .... | .... | 105 556 | 902 157 | 74 207 | 589 108 | 791 346 | 3 326 014 |
| Totals | 12 883 639 | $26 436 934 | 1 081 509 | $5 936 189 | 5 351 769 | $13 505 751 | 1 579 264 | $5 768 615 | 20 896 208 | $51 647 489 |

* January to June.

## BEAMS BROS PTY LTD

No alterations or additions were made to the plant or equipment during the year.

## BENDERS SPREADING SERVICES, IDA BAY

With the continuing shut down of Electrona Carbide Industries, the company has operated at around 30 per cent capacity with production limited to supplying only metallurgical and agricultural outlets.

## GOLIATH PORTLAND CEMENT CO. LTD, RAILTON

No major alternations or modifications to plant or equipment were carried out during the period under review.

## MOLE CREEK LIMESTONE: DAVID MITCHELL ESTATE LTD

Major plant alterations included the installation of a 50 tonne weighbridge, a new apron feeder and a 25 tonne feed bin. A new mobile compressor and a second-hand tractor were purchased for the quarry and works.

The workforce remained at eighteen throughout the year.

## BLENKHORN RAILTON LIME PTY LTD

No changes were reported.

## PEBBLES

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 22 417 | 426 438 | 1980–1981 .... .... .... .... | 2 078 | 66 245 |
| 1979 .... .... .... .... .... | 1 515 | 47 390 | 1981–1982 .... .... .... .... | 2 372 | 77 880 |
| 1980* .... .... .... .... .... | 993 | 31 539 | 1982–1983 .... .... .... .... | 1 222 | 62 155 |
| | | | Total .... .... .... .... | 30 597 | $711 647 |

* January to June.

## MINERAL SUPPLIES, ULVERSTONE

The collection of pebbles for grinding was continued on the beaches in the Ulverstone area. The output was 833 tonnes, valued at $60 600. An average of six persons was employed.

## SILICA

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| 1936–1978 .... .... .... .... | 445 279 | 1 118 728 | 1980–1981 .... .... .... .... | 10 490 | 60 760 |
| 1979 .... .... .... .... .... | 8 397 | 47 800 | 1981–1982 .... .... .... .... | 11 935 | 69 356 |
| 1980* .... .... .... .... .... | 5 175 | 29 770 | 1982–1983 .... .... .... .... | 15 844 | 89 355 |
| | | | Total .... .... .... .... | 467 120 | $1 415 769 |

* January to June.

### INDUSTRIAL SANDS PTY LTD, EAGLE POINT

Ninety thousand dollars was expended on upgrading plant to increase capacity and provide a specialised bagged concrete mix for the Antarctic.

The improvements included —

New feed hopper at the washing plant.

New L.P. gas heated sand dryer.

Specialised bagging equipment.

## 3. CONSTRUCTION MATERIALS

### BUILDING STONE

#### Freestone

One hundred and twelve cubic metres of freestone were quarried at a value of $4 210.

#### Red Granite

Four hundred and fifty-two cubic metres of red granite were produced at a value of $4 520.

### CRUSHED AND BROKEN STONE

#### Basalt

A total of 560 629 cubic metres of basalt was quarried, the value of production was $5 997 109.

### TALISKER BLUE METALS, LAUNCESTON

Quarry face and crushing operations were closed down in November 1982 and will recommence in July 1983.

The market was supplied from stockpiled crushed material during the last seven months of the year.

The workforce was reduced from seven at the start of the period to one in November 1982 and had been increased to three in June 1983.

### BMG QUARRIES, BRIDGEWATER

During the year the operations of BMG Resources Limited were taken over by Boral. Production at the Bridgewater quarry was 223 250 cubic metres of crushed and broken stone. An average of twenty-two men were employed.

#### Dolerite

A total of 449 092 cubic metres of dolerite valued at $4 873 745 was quarried during the year.

### HOBART BLUE METAL INDUSTRIES, LESLIE VALE

This producer has now become one of the major quarrying companies in the south of the State, having produced 92 820 cubic metres of crushed and broken dolerite. Eleven men were employed.

Planned on modern lines the quarry and plant has had its share of teething problems which resulted in an over-supply of oversize material and difficulties with a balanced throughput of specification products.

Recent modifications to establish a full 200 tonnes per hour production target making full use of the product and facility have included —

Jacques Torrent screen for scalping.

Jaques No. 536 Impactor for shaping.

Jacques No. 40 Gyracone for tertiary crushing.

Two electronic metal detectors.

The original Jaques No. 40 Gyracone is to be reconditioned so that two identical machines can run in parallel.

## PIONEER QUARRY, FLAGSTAFF GULLY

Production of crushed and broken dolerite was 61 531 cubic metres. Eight men were employed at the quarry.

## BMG RESOURCES (FORMERLY READYMIX) LAUNCESTON QUARRIES, REMOUNT ROAD, LAUNCESTON

No changes were reported at this quarry.

Nine men were employed at 30 June 1983.

### Limestone

A total of 22 655 cubic metres valued at $227 440 was produced.

### Sandstone

A total of 8 910 cubic metres valued at $90 820 was produced.

### Other Stone

A total of 553 056 cubic metres valued at $5 440 649 was produced.

## GRAVEL

Production of gravel amounted to 1 316 237 cubic metres valued at $7 916 745 , most of which was used on public roads in all parts of the State.

## BMG RESOURCES, FLOWERY GULLY QUARTZITE QUARRY, BEACONSFIELD

No changes were reported during the period.

The workforce remained steady at eight employees.

## SAND

Production of sand was 229 566 cubic metres, valued at $1 469 497.

## OTHER ROAD-MAKING MATERIALS

Production was 149 535 cubic metres, valued at $770 207.

# 4. FUEL MINERALS

## COAL

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 11 247 476 | 35 864 321 | 1980–1981 .... .... .... | 304 727 | 5 628 899 |
| 1979 .... .... .... .... .... | 237 380 | 3 202 108 | 1981–1982 .... .... .... | 395 347 | 9 195 727 |
| 1980* .... .... .... .... | 154 682 | 2 366 903 | 1982–1983 .... .... .... | 548 354 | 12 712 520 |
| | | | Total .... .... .... | 12 887 966 | $68 970 478 |

* January to June.

P. Allan, Mining Engineer, Rosny Park reports —

### CORNWALL COAL COMPANY N.L., FINGAL

#### Duncan Colliery, Fingal

Total production was 373 150 tonnes which with eighty men employed gave an output of 18·9 tonnes per manshift. Pillar extraction in the North-East workings was complete by September 1982 increasing the availability of equipment for development to the north for 1 300 metres through poor ground where 50 per cent of the material is a friable mudstone. A connection was made into the old Duncan main heading but floor heave in the old workings made it impractical for access or ventilation. The connection did however confirm the accuracy of old plans and the absence of gas or water.

The Southern workings were continued to the east a further 400 metres and then were turned south with litte improvement in quality, recovery at times being 40 per cent. There were many fault intersections with up to four metres displacement.

The installation of a new fan at the Southern portal has greatly improved ventilation quality, the increased quantity perhaps being excessive for winter conditions.

A capital expenditure in excess of $1 million has been incurred this year including the costs for the Southern fan system, conveyor and services extensions, a new Domino PET, pumps, surface works including workshop and store and two new shuttle cars in anticipation of full-scale production from the Southern development.

#### Blackwood Colliery, Cornwall

Total production was 175 204 tonnes which with twenty-two men employed gave an output of 34 tonnes per manshift and illustrates the difference in mining conditions between this and the Duncan Colliery.

Mining height was varied from 2·5 metres to 3·5 metres as advantage has been taken, when conditions are favourable, to leave approximately one metre of carbonaceous shale against the roof. Otherwise extraction has been up to the sandstone roof.

Development proceeded a further 640 metres from the portals and another side panel was driven some 250 metres to the west until intersecting the fault which stopped development in this direction the previous year. Drilling the fault indicated it to be some 65 metres across and that it is wedge-shaped which hopefully will allow future headings to traverse it economically before the main headings reach the boundary.

On 25 January 1983 a simple ceremony was conducted in which the Premier of Tasmania, the Honourable Robin Gray, officially opened the colliery following an open day when the operations were visited by customers and suppliers as well as senior company and government officials.

All visitors expressed appreciation of the planning which has succeeded in producing a mine site which blends into the surrounding country and demonstrates that even a colliery can present a neat and tidy appearance.

Capital expenditure this year was some $160 000 which was spent mainly on conveyor and services extensions, and surface work on roads.

#### DUNCAN WASHERY, FINGAL

Once again the throughput has increased with the washery treating 548 354 tonnes of raw coal. At the beginning of the year, the quality of the raw coal feed continued to decline and is reflected in the overall yield of 58·37 per cent. The preliminary development in the Duncan North headings and the continuing poor quality of material in the Duncan South headings were the principal reasons for the low recovery which, towards the end of the year, was approaching 70 per cent indicating the general improvement in mining conditions.

Over $150 000 was spent in increasing live coal storage, a new bin and reject handling equipment, upgrading conveyors and improving the water supply while some $80 000 was spent in construction of new change room facilities.

The company's total sales for the year were 310 151 tonnes and the total work force was 141 men.

### D. FENTON, AVOCA, FENHOPE COLLIERY

Mr Fenton has done little extraction this year, his total production to stockpile being around 200 tonnes. His main activity has been concentrated on the construction of storage bins for raw coal and the associated bridge work connecting the proposed bins to the portal.

Mr Fenton continues to work by himself with amazing results which put some of today's mechanised operations in the shade.

## PEAT

QUANTITY AND VALUE OF PRODUCTION

| *Year* | *Tonnes* | *Value $* | *Year* | *Tonnes* | *Value $* |
|---|---|---|---|---|---|
| Prior to 1979 .... .... .... | 9 044 | 291 353 | 1980–1981 .... .... .... .... | 702 | 132 864 |
| 1979 .... .... .... .... .... | 410 | 78 775 | 1981–1982 .... .... .... .... | 565 | 142 828 |
| 1980* .... .... .... .... .... | 815 | 155 400 | 1982–1983 .... .... .... .... | 890 | 184 230 |
| | | | Total .... .... .... .... | 12 426 | $985 450 |

* January to June.

### COLLINS DEVELOPMENT PTY LTD

This company produced and processed 890 tonnes of peat valued at $184 230.

# 5. FOREIGN ORES

The total value of the metallurgical products of four large works treating foreign ores imported into Tasmania was $341 455 020.

## ALUMINIUM

### COMALCO ALUMINIUM (BELL BAY) LTD, BELL BAY

A capital expenditure of approximately $930 000 was reported for the capital works and plant alterations as follows:—

Air filtration and conditioning to potline crib rooms.
No. 4 Potline.
Sub-station No. 15 upgrading.
Wharf interface.

The workforce was reduced slightly from 1 267 to 1 231 during the period under review.

## FERRO-MANGANESE, FERRO-SILICON AND SILICO-MANGANESE

### TASMANIAN ELECTRO-METALLURGICAL CO. PTY LTD, BELL BAY

During the year a total of 71 939 tonnes of manganese ore was imported from Groote Eylandt. Seventy-three thousand four hundred and twenty-six tonnes of manganese alloys for the steel industry were produced.

Modifications to plant and equipment were kept to a minimum due to the limited finance available. Such modifications and additions that were carried out are listed below —

Replacement of a Ross compressor with a 500 CFM DR4 Atlas Copco compressor.

A mobile screen for general screening purposes was constructed.

'Rainbird' rain guns were installed between No. 3 and No. 5 furnaces.

The road traffic weighbridge was converted from a mechanical dial gauge display to an electronics printer and digital display.

The average workforce was 360.

## TITANIUM DIOXIDE

### TIOXIDE AUSTRALIA PTY LTD, HEYBRIDGE

E. C. Leyland, Senior Mining Engineer, Burnie reports —

Titanium dioxide pigments were produced from imported West Australian ilmenite at the Company's Heybridge plant. Market demand was swamped with 'dumped' overseas product, resulting in the Company receiving low prices for their product, in an attempt to retain local customers. Overseas demand fell alarmingly and continued production resulted in high stocks by the end of the year. Sales of 'Ferri Clear' were 200 tonnes for the year with both mainland and Tasmanian acceptance of the product improving. The approval of this product by health authorities should permit greater penetration of the market.

#### Capital Expenditure

Capital expenditure for the year was $2·382 million an increase of 22 per cent on the figure for 1981–1982. Major items were —

An additional electrostatic precipitator for waste gas treatment and replacement of the existing ducting and old exhaust stack.

A new, updated burner management system was installed on the old I.C.A.L. boilers.

A new automatic control system installed in the plant.

#### Employment

Company employment again decreased during the year to 369 persons. Terminations for this period totalled twenty-two, giving a turnover rate of 7·6 per cent.

## ZINC, CADMIUM, COBALT OXIDE AND SUPERPHOSPHATE

### ELECTROLYTIC ZINC COMPANY OF AUSTRALASIA LIMITED, RISDON

This company, reviewed under Zinc, produced zinc from concentrates imported from Broken Hill together with small quantities of cadmium and cobalt oxide as by-products.

The sulphuric acid derived from roasting the concentrates was used in making superphosphate fertilisers from phosphate rock imported from Nauru, Ocean and Christmas Islands.

# GEOLOGICAL SURVEY BRANCH

## REPORT OF THE CHIEF GEOLOGIST, I. B. JENNINGS

An improvement in the rate of colour geological map production was effected during the year with the printing of Sorell and Hutley 1:50 000 sheets, the re-printing of the Burnie 1:250 000 sheet and the Tasmania 1:500 000 sheet. In addition a special colour map of the Mt Dundas — Mt Lindsay — Mt Ramsay area at a scale of 1:25 000 was also printed. The improvement in colour map production was due in some measure to an increase in drafting services for this work as a result of the run-down in drafting required for coal exploration.

A current backlog of regional mapping will support the planned production of three colour 1:50 000 sheets during 1983–1984. However, the future is less certain due to staff losses imposed upon the Geological Survey over the past few years. This loss of staff has affected its ability to provide services. All sections have shared in the staff reduction and the loss of a structural geologist from the Regional Geology Section has placed a severe strain on the ability of that Section to provide the important geological mapping data upon which successful mineral exploration depends. The Economic Geology Section has also been badly affected by the continued failure to replace the Supervising Geologist and by the loss of a geologist specialised in the important field of non-metallic commodities. At the same time this Section has been required to devote a much greater proportion of its resources to providing advice on policy matters and on the assessment and processing of company reports arising from exploration programmes. The Engineering Geology and Groundwater Section has also lost staff and with the continuing drought in the early part of the year was hard put to keep pace with the demands for services.

It is pleasing to report that an approach to the Bureau of Mineral Resources to continue aeromagnetic surveys of the potentially mineralised portions of the State, has met with success. The B. M. R. has formulated and approved a three year programme of flying which will result in a semi-detailed coverage of the west and north coasts and a regional coverage of the remainder of the State. This project will be of great value to the mineral exploration industry operating within the State. The bulk of the expenses relating to these surveys will be borne by the B. M. R., with the Department contributing $10 000 during 1983–1984.

With the cessation of the coal drilling programme at Fingal a portion of the Department's drilling resources have been directed to the drilling of a series of stratigraphic holes in the Midlands and Channel areas to elucidate the stratigraphy of our Triassic and Permian sequences. This programme is now substantially complete except for drill holes required to supplement the gravity surveys of the Midlands being carried out as part of the groundwater assessment of that area. Stratigraphic and structural problems of considerable importance have been identified on the West Coast and it is likely that future departmental stratigraphic drilling will be devoted to that region.

As mentioned previously the Engineering Geology and Groundwater Section was hard pressed to meet commitments arising from the continued drought during the summer of 1983. It is pleasing to report that a special programme of boring in the drought affected portions of the East Coast resulted in the completion of eighteen bores of which eight yielded groundwater in the range of 40–400 l/min.

The geophysical services to the Survey were brought up to strength with the appointment of Dr J. Hudspeth. Gravity surveys of the lower Midlands for groundwater resource assessment have been largely completed and other geophysical studies have been made to identify techniques to assist in this study. Seismic and gravity studies have been carried out over the Darwin Crater and an aeromagnetic anomaly near Ocean Beach, Strahan. The upgraded Perkin Elmer 8/32 computer has been placed into service and an introductory course on the equipment for thirty-five departmental staff has been run.

Geologist D. Polya resigned during the year.

At the end of the year the Geological Survey Staff comprised twenty-eight geologists, two editorial staff, one surveyor, seven draftsmen, four technicians and five field assistants.

## REGIONAL GEOLOGY

**Supervising Geologist E. Williams reports —**

1:50 000 Geological Map Series —

Corinna-Zeehan (7914N–S). Geologists A. V. Brown and N. J. Turner continued work in these areas.

Lyell (8013N). Geologists P. W. Baillie, J. Everard and C. R. Calver continued work in this sheet.

Macquarie Harbour (7813S). Geologist Dr M. P. McClenaghan continued work on this sheet.

Ben Lomond (8414N). Geologist C. R. Calver continued work on this sheet.

Snow Hills (8414S). Senior Geologist A. B. Gulline continued his work in this area.

St Helens (8515S). Geologists Dr M. P. McClenaghan and N. J. Turner continued their mapping on this sheet.

Interlaken (8313N). Geologist S. M. Forsyth continued his work in this area.

Dover (8311S). Senior Geologist Dr N. Farmer continued mapping this sheet.

Woolnorth (7816S). Geologist P. W. Baillie started work in this area.

Explanatory notes are being prepared for the following sheets:— Strahan, Oatlands, Maria, Kingborough, St Marys, Pedder, Huntley, Smithton, St Valentines and Eddystone.

The staff of the Section comprised a Supervising Geologist, two Senior Geologists and seven Geologists.

## ECONOMIC GEOLOGY

**Acting Supervising Geologist V. M. Threader reports —**

### Staff

The position of Supervising Geologist remained unfilled during the year. Staff in the Section comprised two Senior Geologists (one of whom acted as Supervising Geologist) and four Geologists.

### Projects

Three members of the Section made a study of the recent aeromagnetic mapping of portion of Western Tasmania and prepared a report outlining anomalous features of interest. Dr K. Corbett prepared and issued a report on the Mt Read Volcanics in the Mt Sedgwick-Lake Dora area as part of his continuing study of these important mineral bearing rocks.

Following the closure of the Rossarden Mine a collection was made of company geological data and drill core and this material has been stored in the Department.

The following projects are continuing:—

Survey of the construction materials of the State.

Preparation of a new Bulletin which will describe the coal resources of the State.

Exploration and monitoring of activities related to the alluvial tin resources of north-eastern Tasmania.

The commodity reviews of tin-tungsten and silver-lead-zinc have been continued and much new data acquired.

### General

Submissions were prepared and accepted for twelve diamond drill holes aimed at solving important stratigraphic and structural problems in West Coast geology, particularly in the mineralised areas.

All members of the Section were involved in the processing of 215 exploration reports which were added to the closed file data system. The Section continued to provide advice and recommendations relating to Exploration Licence renewals and relinquishments.

Liaison was continued with exploration and mining companies, government departments and the public on all matters related to economic geology.

## ENGINEERING GEOLOGY

**Supervising Geologist P. C. Stevenson reports —**

The staff of the Section comprised a Supervising Geologist, two Senior Geologists and three Geologists. One Geologist's position is vacant.

The major project has been the Lower Midlands groundwater survey. This has passed from the geophysical phase to a drilling phase. Two deep stratigraphic diamond drill holes and some exploratory water bores have been put down but hammer rigs have not yet been committed full-time. The drought-inspired East Coast Water Survey has continued and some forty exploratory holes have been completed. The success rate has been about 65 per cent but a higher rate would be expected for production holes. Routine groundwater work in answer to enquiries has been completed at many locations from Pyengana and Winnaleah to Southport. Coastal sand aquifer studies have shown useful resources at Chain of Lagoons, Cressy Beach, Meredith Point and Douglas River for Lands Department camping areas, and a survey is in progress at Steiglitz for St Helens water supply. A paper was given at a Farm Water Supply Seminar at the T.C.A.E., Newnham, and the A.W.R.C. Groundwater Committee met in Hobart in November. The Supervising Geologist was Chairman of the A.W.R.C. Conference on Water in Fractured Rock held in Canberra. Geophysical work and pump testing has continued on selected Hard Rock aquifers.

The landslide advisory service has continued. Landslide searches for conveyancing solicitors has operated at about thirty enquiries per week, and field work on subdivisions at two or three per week. Related work on soil capability mapping with the Department of Agriculture has continued and at least one Urban Soil Map will be available by late 1983.

Foundation studies have included a sewer tunnel at Glenorchy, a stormwater pipeline at Prince of Wales Bay and a dam site at Cygnet. A dry summer gave rise to a large number of houses cracked by expansive soils and work both in mapping and in the laboratory on these difficult materials continues. Advice was given to the Hobart City Council in the ' recycling ' for further use of the Giblin Street quarry.

In teaching activities a Seismic Refraction Workshop was given at the Department of Mines for the Geomechanics Society and two geologists have given a short course in Field Engineering Geology at the University of Tasmania. A work experience pupil and Mr D. Armstrong of the South Australian Department of Mines were visitors during the year.

## GEOPHYSICS

**Geophysicist Dr R. G. Richardson reports —**

An assistant geophysicist (Dr J. W. Hudspeth) was appointed late in the year to allow the section to diversify into the fields of detailed groundwater geophysics and mineral exploration geophysics.

### Regional Projects

The West Coast aeromagnetic survey continues to attract interest. A preliminary interpretation of the data in conjunction with the Economic Geology and Regional Geology Sections has shown a number of features requiring further investigation. One of these, the Ocean Beach anomaly near Strahan, has been located using ground magnetics and is now the subject of seismic and gravity surveys. No further processing of the airborne data has been undertaken.

Negotiations are proceeding with the Bureau of Mineral Resources to co-operate in producing a similar aeromagnetic coverage over the remaining mineralised areas of the State. The Geophysical Section views the extension of the coverage as a matter of urgency because of the rapid stimulation of the exploration industry that follows the release of such data.

The regional gravity survey of the Zeehan area remains suspended as resources have been diverted to other projects. Establishment of a Statewide gravity tie-station network has begun.

### Engineering Geology and Groundwater

Most geophysical surveys related to foundation engineering or groundwater projects continue to be undertaken by the Engineering Geology Section. In particular assistance was given with seismic refraction surveys along the line of a proposed stormwater line at Derwent Park and at a reservoir site in Bellerive.

The regional gravity survey of the Midlands, which is being conducted in conjunction with the Engineering Geology Section, has provided a number of sites for deep drilling and the first two of these have been successfuly drilled without encountering dolerite. A programme of detailed geophysical surveys has commenced to provide better prediction of water yields and quality.

### Ore Deposits

No surveys were undertaken during the year but a number of mineral exploration companies were advised on particular methods and techniques. Regular reviews of company performance were made

### Other Deposits

Partial cataloguing of the Departmental holding of offshore data in conjunction with the library, allowed easier retrieval of information for companies taking an interest in the oil potential of offshore Tasmania. Cataloguing is continuing. The first commercial on-shore seismic reflection survey performed in Tasmania was observed in detail and the results studied closely.

### Computing

The in-house minicomputer has been upgraded to reduce our dependence on external services. Programme and data transfer has commenced and users have found the system to be more friendly than previously. Formal training of users has commenced.

Programming and maintenance of accounting procedures continued with most time being spent adapting programmes to the changing needs of the Accounts Section.

### General

A seismic refraction and gravity survey were performed in the Darwin Crater to provide an estimate of target drilling depth. The seismic data indicated a depth of approximately 180 metres in a very faulted environment. The gravity data have not yet been processed.

At the request of the Economic Geology Section the Ocean Beach magnetic anomaly was positioned using ground magnetics and a seismic refraction traverse recorded along strike. A gravity survey of the anomaly and the surrounding area has commenced.

## GEOCHEMISTRY

**Geochemist Dr W. E. Baker reports —**

Regional sampling of the Lisle gold field has been completed in this period but analytical work has continued to be frustrated by inadequate performance of the atomic absorption equipment in furnace mode. Some 2 000 gold analyses were carried out and a back log of about 500 remain to complete the regional appraisal of the gold field.

Papers on the role of organic matter in mineral degration and on biogeochemical approaches to gold exploration were presented at a colloquium on organic matter and mineral exploration held in Los Angeles. Recent contributions to the understanding of trace element distribution in plants has led to an increase in biogeochemical prospecting and some of the emerging results will be applicable to Tasmanian projects.

Investigation of the potential of organic matter in waters as an exploration method continues. The final assessment is awaiting the arrival of chemicals from overseas.

Report verification and evaluation of forty-two company reports was undertaken.

## MINERALOGY AND PETROLOGY

**Mineralogist and Petrologist Dr D. C. Green reports —**

During the year work continued on three main projects. Most of the core from the Coles Bay drill hole has been described in detail, the mineralogy, petrology, fracture patterns and alteration features logged, and samples prepared for chemical analysis of major and trace constituents, including rare earth elements. The newly acquired magnetic separator has been used —

*(a)* to prepare pure concentrates of biotite and hornblende for potassium-argon dating by AMDEL and;

*(b)* to develop a more reliable means of assessing heavy mineral proportions in beach sands, particularly samples from the departmental drilling project in coastal sands.

Mineral identification, including fibres, continues at the normal level and extensive use is made of the X-ray diffraction equipment. A grant from the National Estate to facilitate the preparation of a register of Tasmanian sandstones suitable for building restoration was accepted, the project is well underway and good progress has been made by Mr C. Sharples, the successful applicant for this part-time position. The thin section and polished section equipment is operating well with efficient production of slides for the Geological Survey. An increase in the amount of mineralogical work requiring microprobe analysis has placed more emphasis on the preparation of polished thin sections and a greater use of the Central Science Laboratory facility at the University of Tasmania.

Two papers written in collaboration with Dr C. P. Rao (University of Tasmania) have been published in international journals. These deal with the distinctive carbon and oxygen isotope features of the carbonate sediment deposited on the shelf around the Tasmanian coastline during the Permian and also those currently being deposited on the sea floor.

A new technique for combustion of organic material, including coal and marine organisms, has been developed in conjunction with a Ph.D student in Zoology, Miss G. Fenton. This will permit both D/H and C13/C12 ratios to be measured and has important implications in the study of conditions of coal formation, in tracing marine food chains and in recognition of upwelling zones in the oceans as the sites of petroleum source sediments.

A start has been made on the large backlog of entries in the Department catalogue of rock specimens with a view to incorporation in a Statewide data file. This work is proceeding slowly pending the availability of additional personnel and development of the software for the recently upgraded Perkin-Elmer computer.

Other projects include a mineralogical and genetic study on the Tonganah clay deposit in north-eastern Tasmania and a limited amount of work on the hydrothermal alteration surrounding the Williamsford (Hercules) lead-zinc ore body.

## PALAEONTOLOGY

**Palaeontologist M. J. Clarke reports —**

Good progress has been maintained in several areas, although field studies have been more limited than usual.

A suite of the unusual linoproductid brachiopod *Anidanthus* from the St Marys area has now been prepared. The material is very well-preserved and throws new light on this controversial genus. A manuscript for publication is in preparation.

Improved exposure due to recent road construction in the Harts Hill area near Margate has allowed the collection of a considerable amount of material from the lower parts of the Hickman Formation, and demonstrates the existence of a marine *branxtonensis* Zone fauna (Early Bernacchian) for the first time. Elsewhere in Tasmania this interval is wholly non-marine.

Eldon Group (Siluro-Devonian) faunas from the Lyell Quadrangle have been identified and assessed.

An important discovery of Late Cambrian saukiid trilobites from Mt Misery is being studied by Dr J. B. Jago (South Australia).

Fully cored diamond drill holes at Mt Nassau and The Quoin have provided important new information on the Lower Parmeener Super-Group. A series of palaeogeographic/isopach maps incorporating recent drilling information for the Late Palaeozoic of Tasmania have been prepared.

Dr E. M. Truswell (Bureau of Mineral Resources, Canberra) continues her palynological studies of material from the Douglas River, Mt Nassau, the Quoin and Musselroe Bay drill holes. The Douglas River hole has proved to be particularly significant in allowing a close synthesis of the palynological and marine macro-invertebrate data. The Tasmanian Late Permian microfloras lack diversity and resemble those from the Transantarctic Mountains. A manuscript is in preparation for publication under joint authorship.

The Maria Island Explanatory Report has been completed and is now in press. Rocks and fossils were provided for a display on the geology of Maria Island for the Mapping Exhibition at Eastlands.

A permanent departmental display illustrating the modes of preservation and stratigraphic distribution of Tasmanian fossils has been set up.

Annual and Long Service Leave was taken during the period August–November.

## SURVEYING

**Surveyor G. Benn reports —**

The following surveys were carried out during the year —

Monitoring of landslip movement at:

East Devonport — Brooke Street slip,

Penguin — Grooms slip,

Launceston — Lawrence Vale Road slip,

St Leonards — Wanstead slip,

Legana — Beach road.

Continuation of surveying of boreholes at Gladstone.

Surveying of boreholes at: Granton, Stanley, Montagu, Winnaleah, The Quoin (Ross), Spring Hill, Woodbury, Sheffield, Melton Mowbray, Ross, Bothwell, Oatlands, Tunnack, Tunbridge, Cygnet.

Surveying grids laid out at: Strahan, Queenstown (Darwin Crater), Waratah.

Further surveying at Beauty Point for landslip zoning.

Mining leases at Derby, Rossarden, Pioneer.

Derby, town water supply.

Surveying at Birches Inlet for the Regional Geology Section.

Plans were produced of all surveys.

## CARTOGRAPHY

**Senior Draftsman D. H. Hardy reports —**

The following progress was made on colour map production:—

1:50 000 Series

Sorell Sheet No. 83 — printed in 10 colours.
Huntley Sheet No. 73 — printed in 14 colours.
Blue Tier Sheet No. 33 — fair drawing proceeding.
Eddystone Sheet No. 25 — fair drawing has commenced.

Mt Dundas–Mt Lindsay–Mt Ramsay special area map 1:25 000

Sheet 1 — printed in 11 colours.
Sheet 2 — fair drawing proceeding.

The Geology of Tasmania 1:500 000 was reprinted.

The Burnie Sheet 1:250 000 series was reprinted.

The logging of all our filed plans in preparation for microfilming is proceeding.

The balance of time was spent producing 110 geological and engineering plans and diagrams for unpublished reports and normal field services.

## PUBLICATIONS

**Publications Officer E. L. Martin reports —**

### Publications

The following publications were printed:—

Geological Survey Bulletin 59. Geology and groundwater resources of the Longford Tertiary Basin, by W. L. Matthews, 1983.

Geological Survey Bulletin 61. Geology of the Ringarooma — Boobyalla area, by M. P. McClenaghan, N. J. Turner, P. W. Baillie, A. B. Brown, P. R. Williams and W. R. Moore, 1982

Geological Survey 1:250 000 Explanatory Report SK55/5, Queenstown, 1983 (reprint).

The following publications were in preparation at the end of the period:—

Geological Survey 1:50 000 Explanatory Report Sheet 68, Oatlands.
Geological Survey 1:50 000 Explanatory Report Sheet 77, Maria.
Geological Survey 1:50 000 Explanatory Report Sheet 83, Sorell.

### Microfiche Editions

The following new microfiche editions were being filmed at the end of the period:—

Geological Survey Bulletins —

1. The Mangana Goldfield, by W. H. Twelvetrees.
3. The Mount Farrell Mining Field, by L. K. Ward.
8. The Ore-Bodies of the Zeehan Field, by W. H. Twelvetrees and L. K. Ward.
9. The Scamander Mineral District, by W. H. Twelvetrees.
10. The Mount Balfour Mining Field, by L. K. Ward.
12. The X River Tinfield, by L. K. Ward.
16. The Jukes-Darwin Mining Field, by C. L. Hills.
18. Geological Reconnaissance of the Country between Cape Sorell and Point Hibbs, by C. L. Hills.
19. The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part I. Mount Read Group, by C. L. Hills.

20. The Catamaran and Strathblane Coalfields and Coal and Limestone at Ida Bay, Southern Tasmania, by W. H. Twelvetrees.
23. The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part II, Rosebery Group, by C. L. Hills.
24. Reconnaissance of the Country between Recherche Bay and New River, Southern Tasmania, by W. H. Twelvetress.
25. The Gladstone Mineral District, by W. H. Twelvetrees.
26. The Tinfield of North Dundas, by H. Conder.
27. The Bangor Mineral District, by W. H. Twelvetrees.
28. The North Pieman and Huskisson, and Sterling Valley Mining Fields, by A. M. Reid.
30. The Mt Pelion Mineral District, by A. M. Reid.
31. The Zinc-Lead Sulphide Deposits of the Read-Rosebery District, Part III, Metallurgy and General Review, by C. L. Hills.
35. The Sub-Basaltic Tin Deposits of the Ringarooma Valley, by P. B. Nye.
37. The Golconda Gold Mining District, by A. M. Reid and Q. J. Henderson.
40. Avoca Mineral District, by A. M. Reid and Q. J. Henderson.
41. The Smithton District, by P. B. Nye, K. J. Finucane and F. Blake.
47. Structure and Petrology of the Raglan Range, by R. D. Gee.
52. Gravity Survey of the Hobart District, by D. E. Leaman.

Geological Survey Mineral Resources —

8. The Oil Shale Resources of Tasmania, Vol. I, by A. M. Reid.

Unpublished Reports — For the Years 1977 and 1979.

## Unpublished Reports

Forty-six reports were produced during the period.

## Data Bases and Computing

The existing data-bases were maintained and extended, and search requests fulfilled.

Following the upgrading of the Perkin-Elmer minicomputer and the introduction of a new operating system all FORTRAN programs were modified to run on the new system.

Towards the end of the period an investigation as to the practicability of transferring data from the Department's minicomputer to the Government Printer's phototypesetter was successfully concluded. FORTRAN programmes were developed to convert disc text files to magnetic tape files in DEC DOS stream-ASCII format. This development will enable the presentation of our publications to be considerably improved. Any increase in printing costs should be largely offset by a reduction in the number of printed pages consequent on the change from typescript to typeset text.

The Publications Officer continued to serve as Tasmanian representative on the Australian Earth Sciences Information System Advisory Committee.

## Photography

About 200 colour slides were added to the departmental collection. Subjects included field photographs for the Oatlands, Kingborough and Sorell Explanatory Reports; cuttings along the Latrobe railway deviation; foreshore morphology in the Lillico-Don Heads area; aerial views of coastal landslip areas from Northdown to Preservation Bay; and rock specimens from the Oatlands Quadrangle. Colour prints were produced to illustrate reports and for exhibition purposes.

## List of Unpublished Reports — July 1982–June 1983

| *No.* | *Title* | *Author* | *Date* |
|---|---|---|---|
| 1982/25 | Stratigraphy and correlation of the Mt Read Volcanics and associated rocks in the Mt Sedgwick — Lake Beatrice area and the Lake Dora–Lake Spicer area | K. D. Corbett | 15.7.82 |
| 1982/26 | Water supply possibilities at Mt Nicholas | W. L. Matthews | 21.7.82 |
| 1982/27 | DSKCPY — a disc copying utility for the Department of Mines Perkin-Elmer minicomputer (revision 1) | R. G. Richardson | 22.7.82 |
| 1982/28 | House cracking at Carinya Street, Blackmans Bay | D. J. Sloane | 27.7.82 |
| 1982/29 | A diamond drill hole at Mt Nassau, near Granton | M. J. Clark<br>N. Farmer | 20.8.82 |
| 1982/30 | Petrography of eighteen Tertiary basalt samples, two altered dolerite samples, and a tuff sample from the Sorell Quadrangle | J. L. Everard | 19.8.82 |
| 1982/31 | A theoretical basis for gravity residual specification | R. G. Richardson | 24.8.82 |
| 1982/32 | Rock slope stability at the Giblin Street quarry | R. C. Donaldson<br>A. T. Moon | 6.9.82 |
| 1982/33 | Preliminary site investigation of a proposed reservoir at Heybridge, north-west Tasmania | R. C. Donaldson<br>W. R. Moore | 8.9.82 |
| 1982/34 | Reconnaissance seismic refraction survey of a proposed sewer line at Chigwell | R. C. Donaldson<br>D. A. Polya | 22.9.82 |
| 1982/35 | Proterozoic sedimentary sequences in the eastern part of the Pedder Quadrangle, south-western Tasmania | C. R. Calver | 14.10.82 |
| 1982/36 | Investigation of a salt water drainage problem in a Legana orchard | D. A. Polya | 14.10.82 |
| 1982/37 | Investigation of an agricultural dam site near Hillwood | D. A. Polya | 19.10.82 |
| 1982/38 | Slope stability investigation of a proposed subdivision at Windermere | W. R. Moore | 19.10.82 |
| 1982/39 | The 1981 West Coast aeromagnetic survey: summary of information and results | K. D. Corbett<br>R. G. Richardson<br>P. L. F. Collins<br>G. R. Green<br>A. V. Brown | 21.12.82 |
| 1982/40 | WBASE: a data-base system for Tasmanian waters | D. A. Polya | 27.10.82 |
| 1982/41 | Major and trace element analyses of Triassic basalts, north-east Tasmania | C. R. Calver | 5.11.82 |
| 1982/42 | Author index to Unpublished Reports issued by the Tasmania Department of Mines, 1971–1980 | E. L. Martin | 10.11.82 |
| 1982/43 | Author index to Unpublished Reports issued by the Tasmanian Department of Mines, 1981 | E. L. Martin | 10.11.82 |
| 1982/44 | The production of ternary diagrams from WBASE data | E. L. Martin | 25.11.82 |
| 1982/45 | Tasmanian Proterozoic rocks | N. J. Turner | 6.12.82 |
| 1982/46 | Preliminary map and rock descriptions for the 'Regional geology of the Dundas–Mt Lindsay–Mt Ramsay area', western Tasmania | A. V. Brown | 7.12.82 |
| 1982/47 | A groundwater test hole at Hagley Station Road | W. L. Matthews | 21.12.82 |
| 1983/01 | Final report on exploratory drilling at the All Nations mine, Moina | P. L. F. Collins | 10.1.83 |
| 1983/02 | Soil salinities at Port Arthur | P. C. Stevenson | 25.1.83 |
| 1983/03 | Introductory notes for a survey of the coal resources of Tasmania | C. A. Bacon | 1.2.83 |
| 1983/04 | The Cygnet coalfield | C. A. Bacon | 8.2.83 |
| 1983/05 | The Kaoota (Sandfly) coalfield | C. A. Bacon | 11.2.83 |
| 1983/06 | The Mt Lloyd coalfield | C. A. Bacon | 21.2.83 |
| 1983/07 | The Merrywood coalfield | C. A. Bacon | 25.2.83 |
| 1983/08 | The Strathblane, Hastings, Ida Bay, Moss Glen and Catamaran coalfields | C. A. Bacon | 21.2.83 |
| 1983/09 | Site investigations at a proposed dam site on Nicholls Rivulet, near Cygnet | D. J. Sloane | 2.3.83 |
| 1983/10 | Author index to Unpublished Reports issued by the Tasmania Department of Mines, 1982 | E. L. Martin | 28.2.83 |
| 1983/11 | The erosion of granite-derived soils in eastern and north-eastern Tasmania, with reference to forestry operations. Part 1: Hydrologic cycle, erosion, and previous investigations | D. J. Sloane | 30.3.83 |
| 1983/12 | The erosion of granite-derived soils in eastern and north-eastern Tasmania, with reference to forestry operations. Part 2: Investigation of erosion at forestry coupe EL. 1, Chain of Lagoons | D. J. Sloane | 30.3.83 |
| 1983/13 | The erosion of granite-derive soils in eastern and north-eastern Tasmania, with reference to forestry operations. Part 3: Proposed forestry development in far north-east Tasmania | D. J. Sloane | 3.5.83 |
| 1983/14 | Investigation of a leaking dam at Evandale | W. L. Matthews | 21.4.83 |
| 1983/15 | Petrology of contact metamorphosed Mathinna Beds, near Trigonia Corner, Maria Island | J. L. Everard | 26.4.83 |
| 1983/16 | First recorded occurrence of *Geisonoceras* sp. in Tasmania | A. V. Brown<br>B. A. Stait | 28.4.83 |
| 1983/17 | Gold in vegetation as a prospecting method in Tasmania | W. E. Baker | 10.5.83 |

LIST OF UNPUBLISHED REPORTS — JULY 1982–JUNE 1983 — *continued*

| *No.* | *Title* | *Author* | *Date* |
|---|---|---|---|
| 1983/18 | A diamond drill hole at the Quoin, south-east of Ross .... .... .... .... .... | M. J. Clarke<br>N. Farmer | 10.5.83 |
| 1983/19 | Pump tests on a water bore at Cygnet .... .... .... .... .... .... .... .... .... | W. L. Matthews | 26.5.83 |
| 1983/20 | Site investigation for a proposed stormwater line, Lampton Park, Prince of Wales Bay, Hobart .... .... .... .... .... .... .... .... .... .... .... .... .... .... | R. C. Donaldson<br>D. J. Sloane | 1.6.83 |
| 1983/21 | Heavy minerals in Quaternary and Recent sands in Tasmania .... .... .... | D. C. Green | 17.6.83 |
| 1983/22 | The Mount Christie — Stanhope coalfield .... .... .... .... .... .... .... .... | C. A. Bacon | 28.6.83 |
| 1983/23 | Geological investigation of the Remount Refuse Disposal Project .... .... .... | A. T. Moon | 27.6.83 |

NON DEPARTMENTAL PUBLICATIONS

CLARKE, M. J.; FARMER, N. 1982. Late Paleozoic cold-water carbonate sedimentation. [discussion] *J. sedim. Petrology* 52:682-683.

MOON, A. T. 1983. Residual shearing mechanics in natural soils, in *Australian Geomechanics*: 78–80. Institute of Engineers, Australia: Barton, A.C.T.

RAO, C. P.*; GREEN, D. C. 1982. Oxygen and carbon isotope of Early Permian cold-water carbonates, Tasmania, Australia. *J. sedim. Petrology* 52:1111-1125.

RAO, C. P.*; GREEN, D. C. 1983. Oxygen- and carbon-isotope composition of cold-water carbonates of Tasmania, Australia. *Marine Geol.* 53:117-129.

STEVENSON, P. C. 1982. A review of groundwater in fractured rocks. *Conf. Ser. Aust. Water Res. Counc.* 5:199-205.

The following papers were published in ' Geology, mineralisation, exploration: Western Tasmania. A symposium in honour of the late K. O. Reid, Queenstown; November 1982 '—

POLYA, D. A. The Murchison Gorge: a section through a massive sulphide circulation system

LEAMAN, D. E.*; RICHARDSON, R. G. Role of gravity method in mineral exploration.

GREEN, G. R. Oxygen isotope and mineralogical zonation around the Kuroko massive sulphide deposits, Japan and its exploration significance.

CORBETT, K. D. Review of progress and problems in the stratigraphic and facies analysis of the Mt Read Volcanics.

BROWN, A. V. Exploration targets within the Dundas Trough — a regional approach.

BROWN, A. V. Excursion Guide A1: A geological cross-section of the Dundas Trough (Pieman Road).

COLLINS, P. L. F. Excursion Guide A2: Geology and mineralisation at Mt Bischoff and Renison Bell.

WALLACE, D. B.*; GREEN, G. R. Excursion Guide A 3: Que River mine and aspects of the Mt Read Volcanics in the Pieman River area.

CORBETT, K. D.; BIRD, M.* Excursion Guide B1: Geology of the Mt Lyell area.

BAILLIE, P. W. Excursion Guide B2: Wilderness flight over Franklin/Lower Gordon River areas.

Non-Departmental joint authors are indicated by an asterisk.

## LIBRARY

**Librarian Margaret Ellis reports —**

The year 1982–1983 was taken up mainly with the gradual organising of the collection following the move in the previous year. Some areas of the library, notably the map collection, are showing obvious signs of neglect which was due in part to inadequate storage in the old building. It is anticipated that it will take some time before the whole map collection is satisfactorily organised.

A good deal of effort was put into the indexing and organisation of offshore oil data with the assistance and advice of Geophysicist Dr R. Richardson. This large and valuable collection of data is of special interest as it will form the basis upon which further offshore oil exploration will be based.

The organisation of the library shelves was the most important and time consuming task undertaken in the year. The library stock is now shelved in two sequences-open access and a stack collection housed in the compactus shelves. Most of the collection was weeded during unpacking and serial accession cards also updated in some cases. In addition efforts have been made to unify and reorganise the map collection in its new location.

Work is continuing on the retrospective indexing of Offshore Reports covering the Bass Basin area as well as the indexing of Closed File Offshore Reports. Oil well data have also been reorganised.

The library continued to catalogue new material, the catalogue cards being produced by the State Library. Eighty volumes were sent to the State Library Bindery for binding.

## Statistics

| | |
|---|---|
| Loans (excluding 115 journal titles circulated regularly) | 409 |
| Reference queries .... .... .... .... .... .... .... .... | 866 |
| Manual literature searches .... .... .... .... .... .... | 367 |
| Computerised literature searches .... .... .... .... .... | 2 |

## Staff

The library staff remained the same as the preceding year, the Librarian being Mrs Margaret Ellis, and the assistant, Mrs Janet Richardson.

# CHEMICAL AND METALLURGICAL BRANCH

## REPORT OF THE CHIEF CHEMIST AND METALLURGIST, H. K. WELLINGTON, B.E., F.S.A.S.M., M.Aus.I.M.M.

The number of samples registered was a little lower than last year (2 494) but the number of determinations (9 879) was quite high reflecting more work per sample. Complete rock analyses done, including four coal ash analyses, totalled 106.

Tin was again the determination to head the list with 1 903 followed by gold with 534. Record numbers of determinations were made for gallium, thorium, uranium and vanadium which were as traces in rocks.

The ' Clay and Ceramic ' section has been closed following the end of specialised work in this field.

### TYPE AND NUMBER OF TESTS

| *Type of Test* | *Number* | | *Type of Test* | *Number* | |
|---|---|---|---|---|---|
| I. QUANTITATIVE — | | | B. Miscellaneous | | |
| A. Elements — | | | Acidity | 1 | |
| Aluminium | 136 | | Ash | 22 | |
| Antimony | 91 | | Cassiterite grain sizing | 11 | |
| Arsenic | 331 | | Combined water | 247 | |
| Barium | 118 | | Grit | 3 | |
| Bismuth | 119 | | Hydroxide | 1 | |
| Cadmium | 2 | | Insoluble | 1 | |
| Calcium | 119 | | Loss on ignition | 99 | |
| Carbon | 257 | | Moisture | 261 | |
| Chromium | 130 | | Solubility | 1 | |
| Cobalt | 110 | | Specific energy | 3 | |
| Copper | 415 | | | 650 | |
| Fluorine | 9 | | C. Waters, etc.— | | |
| Gallium | 102 | | Complete analysis | 353 | |
| Gold | 534 | | Partial analysis | 190 | |
| Iron (ferric) | 116 | | | 543 | |
| Iron (ferrous) | 102 | | D. Industrial liquors — | | |
| Lead | 386 | | Acid acceptance value | 4 | |
| Lithium | 9 | | Acid titration | 4 | |
| Magnesium | 108 | | Cleaner concentration | 4 | |
| Manganese | 118 | | Chlorine | 4 | |
| Molybdenum | 112 | | Chromium | 20 | |
| Nickel | 354 | | Copper | 2 | |
| Niobium | 108 | | Cyanide | 2 | |
| Phosphorus | 107 | | Deoxidiser titration | 4 | |
| Potassium | 125 | | Reaction products titration | 4 | |
| Rubidium | 109 | | Sulphur | 16 | |
| Scandium | 93 | | Zinc | 1 | |
| Silicon | 112 | | | 65 | 9 530 |
| Silver | 111 | | II. QUALITATIVE | | 45 |
| Sodium | 106 | | III. METALLURGICAL | | |
| Strontium | 102 | | Crushing | 2 | |
| Sulphur | 122 | | Examination | 36 | |
| Tin | 1 903 | | Flotation | 1 | |
| Tantalum | 7 | | Gold extraction | 5 | |
| Thorium | 127 | | Jig | 1 | |
| Titanium | 106 | | Magnetic separation | 7 | |
| Tungsten | 410 | | Panning | 2 | |
| Uranium | 127 | | Sizings | 249 | |
| Vanadium | 127 | | Table | 1 | |
| Yttrium | 108 | | | | 304 |
| Zinc | 382 | | | | |
| Zirconium | 102 | | Total | | 9 879 |
| | 8 272 | | | | |

## RESEARCH INVESTIGATIONS

| | | | |
|---|---|---|---|
| Clay | 1 | Tin | 5 |
| Coal | 1 | Tin/Tungsten | 3 |
| Gold | 1 | Tungsten | 2 |
| | | Total | 13 |

## SUMMARY OF INVESTIGATIONS

### CLAY

**R825 — Tonganah clay mine: Australian Pulp & Paper Mills Ltd**

Following reported problems in using the Tonganah clay in the paper mills a sample was submitted for examination with a view to reducing the abrasion index. This high index value was thought to be due to quartz. The problem was found to be due to relatively large grains of kaolinite.

### COAL

**R826 — Fingal washery: Cornwall Coal Co. N.L.**

A sample of slurry screen feed was submitted for spiral concentration tests which showed concentration was possible even with a spiral not specifically designed for coal.

### GOLD

**R828 — Lisle: Department of Mines**

When geobotanical testing showed gold in pine foliage the geochemist requested a concentration test on the surrounding soil to establish its gold content. The gold recovery was 3·5 g/t as grains from 150 um up to about one millimetre.

### TIN

**R801 & R811 — Blue Tier: Renison Ltd**

This report, by Renison metallurgists S. Cross and W. Selby, gives the test results and an appreciation of the metallurgical aspects of working this deposit at various extraction rates.

**R803 — Mt Bischoff: Metals Exploration Ltd and C.R.A. Ltd**

Additional departmental work to that already reported by Metals Exploration (R803, R807, R813 and R819) is included in this report together with some information previously recorded by Metals Exploration.

**R814 — Pyramid, Upper Scamander: B.H.P. and Shell Exploration**

This project showed that, on an adit sample, reduction to below about 600 um was necessary for tin concentration and tailings should pass 250 um before rejection. A recovery of 53 per cent of the tin in a 54 per cent Sn concentrate or 62 per cent of the tin in a 12 per cent Sn concentrate are the alternatives for this material.

**R816 — ARDLETHAN, N.S.W. TAILINGS DUMPS: ABERFOYLE CENTRAL METALLURGICAL SERVICES**

Test work done by C.M.S. in the Department of Mines pilot plant is reported by C.M.S. staff members D. J. Stribley and G. C. Tapp. Concentration using tables, spirals and flotation was compared.

**R818 — RINGAROOMA BAY TIN DEPOSIT: DEPARTMENT OF MINES**

Following renewed interest in this area the results of work done in 1966 and 1967 for Ocean Mining A.G. were reviewed. The results of test work done at that time have now been presented in report form together with a table of consolidated results for bore core samples.

## TIN AND TUNGSTEN

**R827 — ROSSARDEN RESIDUE DUMPS: H. STACPOOLE**

Six grab samples of coarse tailings were submitted for sizing and metal distribution with a view to assessing their retreatment prospects.

**R829 — ROSSARDEN RESIDUE DUMPS: H. STACPOOLE**

Three bore hole samples from the tailings were submitted for sizing and metal distribution. Subsequent milling and concentration showed about half of the metals could be recovered from the +1·2 mm material and somewhat more metal from the −1·2 mm material.

**R832 — ROSSARDEN RESIDUE DUMPS: H. STACPOOLE**

Samples from slime tailings dams 1 and 2 were submitted for sizing and metal distribution. Dam 2 looks the more promising with about half the metals in recoverable sizes compared with about a third of the metals in dam 1.

## TUNGSTEN

**R824 — KARA MILL: TASMINEX N.L.**

During a visit to the Kara Mill the flowsheet was drawn and samples taken at the concentrate cleaning stage, where a new dry magnetic separator was being commissioned.

**R830 — WOLFRAMITE GRAIN SIZE: ABERFOYLE CENTRAL METALLURGICAL SERVICES**

At the request of Aberfoyle C.M.S. tests were undertaken to determine if a wolframite grain size analysis along the lines of the cassiterite grain size analysis was possible. A sized wolframite sample was subjected to the acid digestions thought necessary for a grain size analysis and the loss of mass and size reduction measured. This indicated it was worth trying the treatment on a naturally occuring wolframite material.

# MINES AND EXPLOSIVES BRANCH

## REPORT OF THE DEPUTY STATE MINING ENGINEER AND DEPUTY CHIEF INSPECTOR OF MINES AND EXPLOSIVES, R. C. THOMAS, A.C.S.M., M.I.M.M., M.Aus.I.M.M., C.Eng.

## THE MINES INSPECTION ACT 1968

### General

During the year the mining industry experienced a continued downturn in activity as a result of low world metal prices, low demand and continuing inflation. Although metal prices were often somewhat higher than in the previous year, in real terms the prices of most metals were lower than for many years.

There were no further total closures of mines, but further retrenchments were carried out at several mines, and operations were reduced in most cases. Mount Lyell, Savage River Mines, Cleveland Tin and King Island Scheelite all closed down for short periods during the year.

### Employment

Major retrenchments took place at King Island Scheelite and at the Electrolytic Zinc Company's West Coast Mines. Other operators reduced employment levels by minor retrenchment or by natural wastage. For the purpose of accident statistics, the average number of persons employed in the mining, metallurgical and quarrying industries during the year was 7 826, a decrease of 1 130 compared with the previous year.

### Accidents

Accidents are reported and recorded in accordance with Australian Standard AS 1885.

There was a 30 per cent reduction in the number of accidents reported which, it is pleasing to note, is greater than the 13 per cent reduction in employment. The frequency rate, incidence rate and number of days lost were also substantially lower than in recent years.

There were no fatal accidents during the year.

## ACCIDENT STATISTICS (AS 1885)

| *Employer* | *Man hours exposure* | *No. of injuries* | *Frequency rate* | *Days lost* | *Incidence Rate (%)* | *Mean Duration (days)* | *No. of Employees* |
|---|---|---|---|---|---|---|---|
| APPM, Tonganah .... .... .... .... .... | 25 668 | .... | 0·0 | .... | 0·0 | 0·0 | 16 |
| Cleveland Tin .... .... .... .... .... .... | 454 820 | 45 | 98·9 | 1 113 | 19·7 | 24·7 | 228 |
| E.Z., Rosebery .... .... .... .... .... .... | 1 553 105 | 422 | 271·7 | 5 022 | 47·7 | 11·9 | 884 |
| King Island Scheelite .... .... .... .... | 416 974 | 38 | 91·1 | 253 | 14·8 | 6·7 | 257 |
| Mt Lyell .... .... .... .... .... .... .... | 1 126 921 | 200 | 177·5 | 2 633 | 28·0 | 13·2 | 714 |
| Que River .... .... .... .... .... .... .... | 218 542 | 34 | 155·6 | 291 | 29·1 | 8·6 | 117 |
| Renison .... .... .... .... .... .... .... | 926 918 | 122 | 131·6 | 1 462 | 23·7 | 12·0 | 515 |
| Savage River .... .... .... .... .... .... | 933 767 | 69 | 73·9 | 848 | 16·0 | 12·3 | 432 |
| Tasminex .... .... .... .... .... .... .... | 43 142 | 4 | 92·7 | 36 | 18·2 | 9·0 | 22 |
| All mines .... .... .... .... .... .... | 5 699 857 | 934 | 163·9 | 11 658 | 29·3 | 12·5 | 3 185 |
| Comalco .... .... .... .... .... .... .... | 2 483 418 | 145 | 58·4 | 2 497 | 11·5 | 17·2 | 1 261 |
| E.Z., Risdon .... .... .... .... .... .... | 3 367 489 | 264 | 78·4 | 3 152 | 14·4 | 11·9 | 1 834 |
| Goliath Cement .... .... .... .... .... | 512 973 | 20 | 39·0 | 112 | 7·3 | 5·6 | 275 |
| Mole Creek .... .... .... .... .... .... | 28 129 | .... | 0·0 | .... | 0·0 | 0·0 | 8 |
| Port Latta .... .... .... .... .... .... .... | 423 129 | 17 | 40·2 | 161 | 8·1 | 9·5 | 210 |
| Temco .... .... .... .... .... .... .... | 702 096 | 14 | 19·9 | 225 | 3·9 | 16·1 | 360 |
| Tioxide Aust. .... .... .... .... .... .... | 776 604 | 25 | 32·2 | 186 | 6·0 | 7·4 | 419 |
| Ceramics .... .... .... .... .... .... .... | 129 405 | 9 | 69·9 | 63 | 13·0 | 7·0 | 69 |
| All works .... .... .... .... .... .... | 8 423 243 | 494 | 58·7 | 6 396 | 11·1 | 13·0 | 4 436 |
| Collieries .... .... .... .... .... .... .... | 263 180 | 48 | 182·4 | 465 | 34·0 | 9·7 | 141 |
| Quarries .... .... .... .... .... .... .... | 141 528 | 12 | 84·8 | 124 | 18·8 | 10·3 | 64 |
| Totals .... .... .... .... .... .... .... | 14 527 808 | 1 488 | 102·4 | 18 643 | 19·0 | 12·5 | 7 826 |

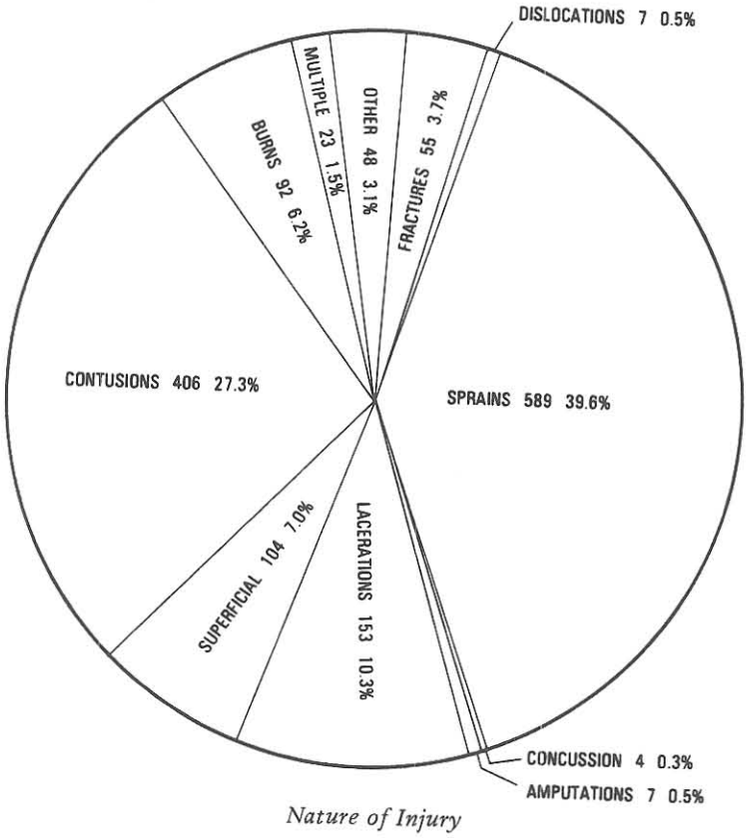
## DESCRIPTION OF FATAL AND SERIOUS ACCIDENTS

### FATAL

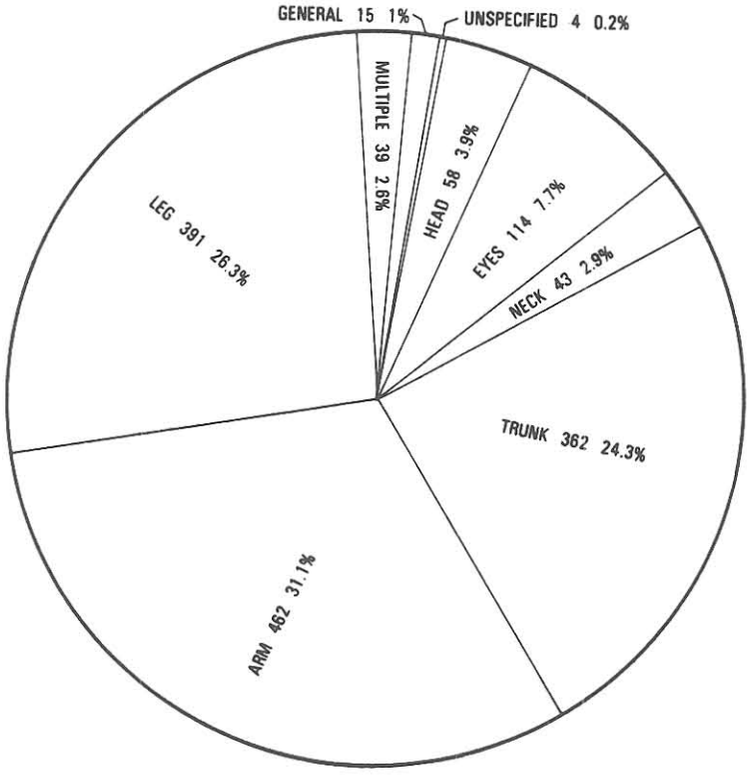
No fatal accidents occurred this year.

### SERIOUS

A. French — Cleveland Tin: Struck by haul truck when it slipped off jack; fractured leg.
G. Barnard — Cleveland Tin: Thrown from runaway FEL; severe lacerations to wrist and leg.
P. Lucas — Comalco: Molten flux fell from fluxing pot; burns to neck, back, leg and both arms.
P. Murrell — Comalco: Hollow cast steel element exploded during welding; shrapnel wound to left arm.
M. N. Whelen — E.Z. Co., Rosebery: Premature explosion while loading hole; severe multiple injuries.
M. Purdy — E.Z. Co., Rosebery: Jumped off stack of palletised stores; fractured ankle.
D. P. Taylor — E.Z. Co., Rosebery: Hand caught in pump drive pully; one finger fractured, one finger amputated.
W. Murach — E.Z. Co., Rosebery: Hand caught in pump drive pulley; finger amputated.
B. Beechey — Mt Lyell: Fell from cab of haulage vehicle; fractured ankle.
L. F. Powell — Mt Lyell: Thrown from runaway ' Myne Truck '; fractured leg.
J. L. Scott — Mt Lyell: Oxy-acetylene cutter set fire to clothing; burns to leg.
P. H. Truehan — Mt Lyell: Fell over loading hose while loading ANFO; fractured leg.
S. Hodgeman — King Island: Falling rock, damaged tendons in arm and shoulder.
B. Burgin — King Island: Falling electric cable; injured neck.
H. W. Donker — Renison: Brace fell while constructing barricade; fractured foot.
J. Batik — Renison: Tackling fire on L.H.D.; fume inhalation.
W. Collins — Que River: Struck by rock in avoiding mud rush; lacerated head.
A. Curle — Que River: Caught by mud rush at skip loading station; fractured ankle.
P. Henri — Temco: Squashed by sand skip; fractured foot.
R. A. Graue — Tioxide: Struck by cargo container side gate; crushed foot.
P. E. Whelan — B.M.G. Quarries: Caught in air-operated control gate; multiple lacerations and contusions.

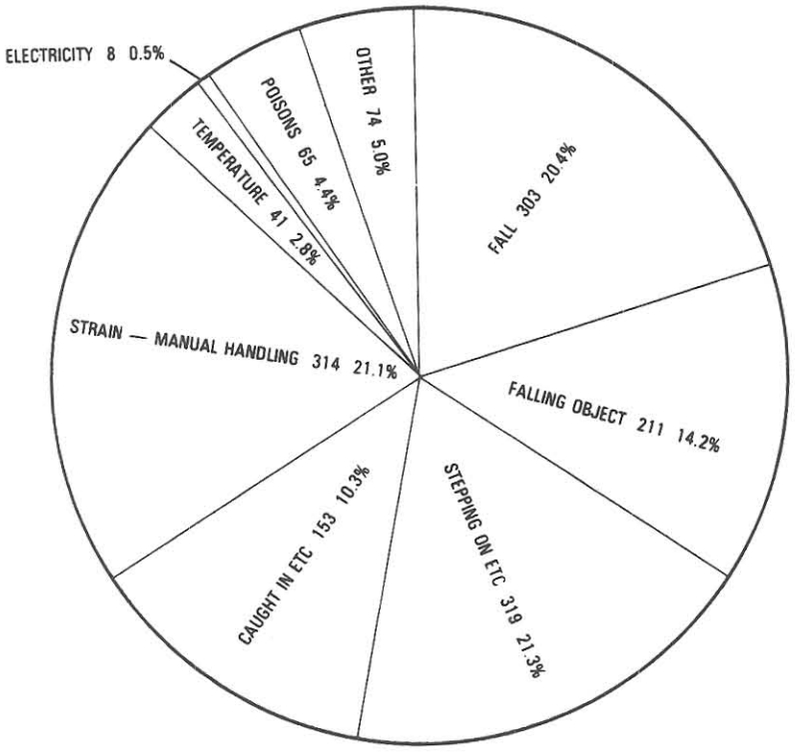



*Nature of Injury*

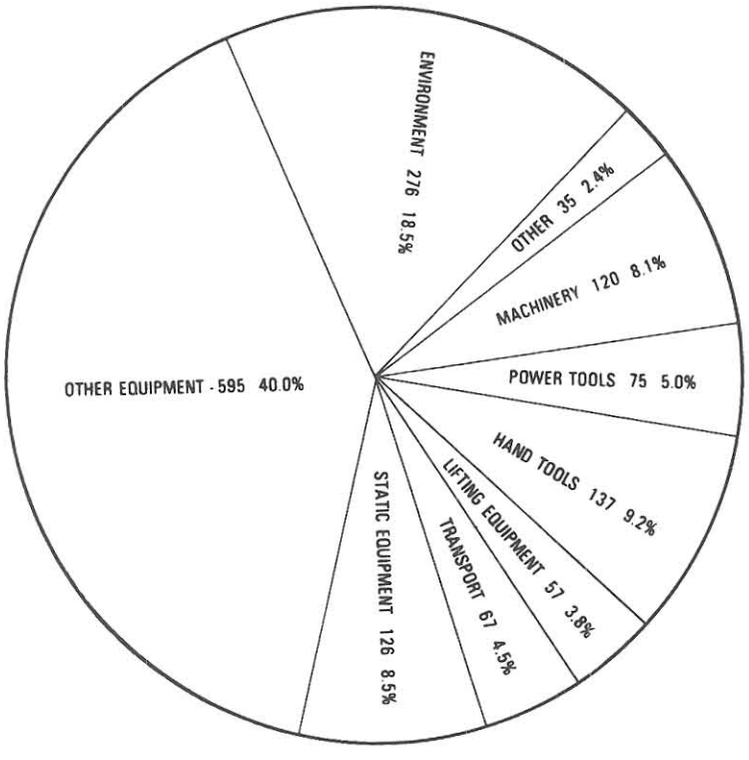



*Location of Injury*

5 cm




*Type of Incident*




*Agency of Injury*

5 cm

## SPECIAL INVESTIGATIONS

**P. Allan, Mining Engineer, Hobart reports —**

### Diesel Engines Underground

The continuing delayed recovery in the industry has again resulted in a quiet year with very few new engines being acquired.

Engines approved either temporarily or permananently throughout the year included —

Slanzi DVA 1030 in a Silla 650 G.P. dumper.
Caterpillar 3304 NA in a scaling carriage.
Caterpillar 3408 DITA in a Cat. 769C.
Toyota L in a Toyota Hi-Lux.
Caterpillar D3306 TA in a DJBD330.
Caterpillar 3304 NA in a Wagner UT45A.
Daihatsu DG in a Daihatsu 4WD service vehicle.
Cummins 555 in a concrete agitator.
Ford BSD 333 in a service platform.

### Investigations

Vibration and building investigations covered the following:—

Department of Main Roads — Vibration and building damage, Canberra Road, Northern Outlet.
Department of Main Roads — Vibratory roller effects on K. C. Holyman Property, Mt Pleasant.
Department of Main Roads — Vibratory roller effects on Department of Agriculture Laboratory, Launceston.
Department of Main Roads — Vibratory roller effects on 66 Ernest Street, Launceston.
Department of Main Roads — Vibratory roller effects on 57 Ernest Street, Launceston.
Department of Main Roads — Vibratory roller effects on R. D. Dickenson's Property, Blacksnake Road, Northern Outlet.
Department of Main Roads — Vibratory roller effects on Braeside Crescent, Launceston.
Department of Main Roads — Vibratory roller effects on Westbury Road, Launceston.
Department of Main Roads — Vibratory roller effects on Luxmore Place, Launceston.
Department of Main Roads — Traffic vibrations, Hobart Road, Launceston.
Tasmanian Pulp & Forest Holdings — Blast effects, Orford.
Australian National Railways — Structural inspection and vibration measurement, Hunter's Mill viaduct.
Metropolitan Water Board — Blasting advice and control. Clarence reservoirs.
Metropolitan Water Board — Blasting advice and control. Hobart water supply pipeline.
Contractor — Blasting advice demolition of sawdust burner.
Contractor — Blasting advice and excavation of foundations for house.
Contractor — Blasting advice excavation for swimming pool.
Clarence Council — Blasting advice excavation for road widening adjacent to houses.

### General

Approvals were granted after examination for —

Du Pont No. 10 Twist blasting machine.
Du Pont Model 200 ohmeter circuit tester.
Bex ANFO loader.
ICI 'Magnadet' tester MT-01.
Du Pont explosives as approved by New South Wales Dangerous Goods Act.

Courses were conducted on behalf of the Tasmania Police in the handling of explosives by the Police Bomb Squad and in the identification of explosives for Civilian Recognition Courses.

The section continues to represent the Department on the Environmental Protection Advisory Council and the Standards Asssociation Committee CE5. It is also now responsible for the application of the Government Energy Management Programme as it affects the Department.

## MECHANICAL INSPECTION

**W. C. Hodgson, M.I.E. (Aust.), Hobart reports —**

Inspections were carried out at —

Diamond Epoch Offshore Drill Rig, Renison; E.Z. Co., Rosebery; Comalco Aluminium; Beaconsfield Gold Mine; Savage River Mine; Cleveland Tin N.L.; Port Latta; Mt Lyell Mine; E.Z. Co., Risdon; Goliath Cement; BMG Quarry, Bridgewater; Rossarden Mine; TEMCO; Devonport L.P. Gas Terminal; Cascades Dam Site.

The following proposals, designs and plants were examined for approval:—

### Renison

Raise bored ventilation rise designed by J. S. Redpath Ltd.

### Goliath Cement

Twelve tonne crane repairs.

### Que River

Removing fire hazards from Eimco 913 LHD vehicles.

### Devonport L.P.G. Terminal

Installation completed and tested.

### Mytton Rodd

L.P.G. equipment for the propulsion of road vehicles.

### Dale Elphinstone

Their new 925 service vehicle.

### E.Z. Co., Risdon

New wharf cranes designed by Deer Park Engineering.

### Miscellaneous

Annual inspection in inflammable liquid and L.P. gas transport vehicles is now well established and approximately 130 have been seen by Transport Commission inspectors.

Steps are being taken to broaden the scope of this service to include other classes of dangerous goods vehicles.

Thirty-nine candidates were examined for certificates of competency.

## ELECTRICAL INSPECTION

**J. M. Hillhouse, Electrical Engineer, Hobart reports —**

Inspections were made, proposals investigated and approvals given for mines and works. The main events were —

### MINES

**Mt Lyell, Queenstown**

General inspection.
Prince Lyell winder controls upgraded.
Installation of 19-level pump station in progress.

**Renison**

General inspection.
11 kV mine feeders and underground substation completed.
Radar-type truck sensor approved for use.

**Electrolytic Zinc Company of Australasia Ltd., Rosebery**

Rosebery mine inspected, including extension of 6·6 kV underground distribution in progress. H.E.C. 110 kV overhead line to be re-routed, approved.

**Cleveland Tin, Luina**

General inspection.
Supply to open cut approved.

**Savage River**

General inspection at mine and pellet plant.
New northern orebody inspected.
Major repairs to crusher switchroom after damage by ore truck.
500 kW water boiler installed at Port Latta.

**King Island Scheelite**

General inspection.
Unmanned weekend operation of power station approved.

**Cornwall Coal**

General inspection of collieries and washery. 22 kV supply to Southern Exhaust Fan approved subject to completion of details.

### WORKS

**Electrolytic Zinc Company of Australasia Ltd**

General inspection.
Supply and control of proposed 2 × 25 tonne wharf cranes approved.

**Electrona Carbide**

Brief inspection: the works are on care and maintenance.

**Comalco, Bell Bay**

General inspection.

New bulk ship unload facility completed and Substation 15 being rebuilt.

**Temco, Bell Bay**

General inspection.

Site of three cable rack fires inspected.

**Goliath Cement, Railton**

General inspection.

H.E.C. 22 kV lines hit by trucks several times: to be raised.

Transformer fault in main substation: cause not yet known.

**Tioxide, Heybridge**

General inspection.

22 kV plant reticulation extended by addition of Substation 5.

QUARRIES

Inspections were made at Benders, Lune River; B.M.G., Bridgewater, HBMI, Margate; Etna Stone, Brighton.

Electrical equipment was found to be generally satisfactory.

In addition, advice was given on reduction of fire and explosion risk at various places and final approval given for the electrical installation at Boral's Devonport L.P. gas terminal.

## DRILLING

**W. Grun, Mining Engineer, Hobart, reports —**

Drilling decreased this year in keeping with the marked decrease in exploration expenditure in the State. A total depth of 12 567 metres was drilled, a 19 per cent drop in output. Contract drilling fell to 2 435 metres being 19 per cent of the total.

A major feature was groundwater investigation; 5 185 metres were drilled, 1 868 metres of which was water boring under contract for landowners. The east coast groundwater survey is proceeding using the Warman and Mayhew drills.

Site investigation for the Department of Main Roads continued with 438 metres being drilled.

Of note were two deep holes drilled with both Longyear 44 drills; 1 008·5 metres was achieved in granite at Coles Bay for a geothermal survey and at Tunbridge a hole was concluded at 914·5 metres, when Precambrian basement was successfully reached.

## DRILLING DETAILS 1982–1983

| *Location* | *Purpose* | *Drill* | *No. of holes* | *Total depth (m)* |
|---|---|---|---|---|
| *Diamond —* | | | | |
| Smithton | Stratigraphic investigation | Longyear 38 No. 2 | 1 | 380·0 |
| Kempton | Stratigraphic investigation | Longyear 38 No. 2 | 1 | 497·0 |
| Bothwell | Stratigraphic investigation | Longyear 38 No. 2 | 1 | 631·0 |
| Granton | Stratigraphic investigation | Edeco | 1 | 12·0 |
| Woodbridge | Stratigraphic investigation | Edeco/ Longyear 38 No. 1 | 1 | 570·0 |
| Darwin Crater | Geological investigation | Longyear 38 No. 1 | 3 | 314·5 |
| Fingal | Coal investigation | Longyear 44 No. 1 | 1 | 229·3 |
| Ross | Stratigraphic investigation | Longyear 44 No. 1 | 1 | 693·6 |
| Tunbridge | Stratigraphic investigation | Longyear 44 No. 1 | 1 | 890·2 |
| Spring Hill | Stratigraphic investigation | Longyear 38 No. 1 | 1 | 221·1 |
| Coles Bay | Geothermal investigation | Longyear 44 No. 2 | 1 | 549·5 |
| Boobyalla | Stratigraphic investigation | Longyear 44 No. 2 | 2 | 616·0 |
| Moina | Mineral investigation | Mindrill 20 No. 2 | 1 | 19·4 |
| Wynyard | Bridge foundations | Mindrill 20 No. 2 | 7 | 42·9 |
| Wandle River | Bridge foundations | Mindrill 20 No. 2 | 1 | 12·0 |
| Swansea | Groundwater investigation | Warman 1000 | 5 | 493 |
| | | Total | 29 | 6 171·5 |
| *Churn —* | | | | |
| Boobyalla | Mineral investigation | Keystone 55 No. 1 | 7 | 110·0 |
| Pyengana | Groundwater investigation | Keystone 55 No. 1 | 8 | 107·0 |
| Branxholm | Groundwater investigation | Keystone 55 No. 1 | 2 | 38·0 |
| Goshen | Groundwater investigation | Keystone 55 No. 1 | 3 | 25·0 |
| Weymouth | Groundwater investigation | Keystone 55 No. 1 | 1 | 36·0 |
| Mussleroe | Mineral investigation | Keystone 55 No. 1 | 68 | 707·0 |
| Huonville | Water bore | Keystone 55 No. 2 | 1 | 13·5 |
| | | Total | 90 | 1 036·5 |
| *Rotary/Down-the-hole-Hammer —* | | | | |
| Scamander | Water bore | Warman 1000 | 4 | 177·0 |
| St Helens | Water bore | Warman 1000 | 2 | 27·0 |
| Pyengana | Groundwater investigation | Warman 1000 | 1 | 60·0 |
| Winnaleah | Water bore | Warman 1000 | 7 | 246·0 |
| Branxholm | Water bore | Warman 1000 | 2 | 48·0 |
| Scottsdale | Water bore | Warman 1000 | 2 | 84·0 |
| Nabowla | Water bore | Warman 1000 | 1 | 42·0 |
| Lilydale | Water bore | Warman 1000 | 6 | 294·5 |
| Patersonia | Water bore | Warman 1000 | 3 | 144·0 |
| Weymouth | Groundwater investigation | Warman 1000 | 1 | 30·0 |
| Hagley | Groundwater investigation | Warman 1000 | 2 | 148·0 |
| Hagley | Water bore | Warman 1000 | 7 | 326·0 |
| Boobyalla | Precollar for stratigraphic hole | Warman 1000 | 1 | 102·0 |
| Boobyalla | Water bore for stratigraphic hole | Warman 1000 | 1 | 16·0 |
| Bicheno | Groundwater investigation | Warman 1000 | 3 | 163·0 |
| Cranbrook | Groundwater investigation | Warman 1000 | 9 | 289·0 |
| Apslawn | Groundwater investigation | Warman 1000 | 2 | 129·4 |
| Swansea | Groundwater investigation | Warman 1000 | 9 | 145·0 |
| Botanical Gardens, Hobart | Groundwater investigation | Mayhew 1000 | 1 | 54·0 |
| Port Arthur | Groundwater investigation | Mayhew 1000 | 5 | 138·0 |
| Tunnack | Groundwater investigation | Mayhew 1000 | 6 | 180·0 |
| Oatlands | Groundwater investigation | Mayhew 1000 | 9 | 234·0 |
| Melton Mowbray | Groundwater investigation | Mayhew 1000 | 2 | 126·0 |
| Swansea | Groundwater investigation | Mayhew 1000 | 5 | 467·5 |
| Grass Tree Hill | Water bore | Mayhew 1000 | 1 | 55·5 |
| Brighton | Bridge foundations | Mayhew 1000 | 4 | 25·0 |
| Cambridge | Water bore | Mayhew 1000 | 20 | 200·0 |
| Old Beach | Water bore | Mayhew 1000 | 2 | 105·0 |
| Hobart Railway Yards | Site investigation | Mayhew 1000 | 3 | 14·5 |
| Tea Tree | Water bore | Mayhew 1000 | 3 | 91·0 |
| Huonville | Water bore | Mayhew 1000 | 1 | 15·0 |
| | | Total | 128 | 4 176·4 |

## DRILLING DETAILS 1982–1983 — *continued*

| *Location* | *Purpose* | *Drill* | *No. of holes* | *Total depth (m)* |
|---|---|---|---|---|
| *Diamond/Auger —* | | | | |
| Winnaleah .... .... | Groundwater investigation | Gemco 210D | 1 | 36·0 |
| Deloraine .... .... | Site investigation | Gemco 210D | 7 | 82·0 |
| Sheffield .... .... .... | Groundwater investigation | Gemco 210D | 3 | 402·1 |
| Ross Area .... .... | Stratigraphic investigation | Gemco 210D | 30 | 375·8 |
| St Leonards .... .... | Site investigation | Gemco 210D | 5 | 88·7 |
| Pyengana .... .... | Bridge foundations | Gemco 210D | 3 | 40·9 |
| Hobart Police Headquarters .... .... | Site investigation | Gemco 210D | 11 | 92·5 |
| Kingston .... .... .... | Road foundations | Gemco 210D | 4 | 20·0 |
| Richmond .... .... | Bridge foundations | Gemco 210D | 4 | 19·5 |
| Mornington .... ... | Geophysical test hole | Gemco 210D | 1 | 26·0 |
| | | Total | 69 | 1 183·5 |

## SUMMARY OF DRILLING

| *Drill Type* | *No. of drilling crews* | *No. of holes* | *Depth drilled (m)* |
|---|---|---|---|
| Diamond .... .... .... .... .... .... .... | 4 | 29 | 6 171·5 |
| Churn .... .... .... .... .... .... .... .... | 1 | 90 | 1 036·5 |
| Rotary/Down-the-hole-Hammer .... .... | 2 | 128 | 4 176·4 |
| Diamond/Auger .... .... .... .... .... .... | 1 | 69 | 1 183·5 |
| | 8 | 316 | 12 567·9 |

## NORTH-WESTERN DISTRICT

**E. C. LEYLAND, A.W.A.S.M., M.Aus.I.M.M.**

**T. E. EVANS, A.R.S.M., B.Sc. (Engng), F.I.M.M., M.Aus.I.M.M., C.Eng.**

**A. S. CHRISTIANSON, B.Sc. (Engng), M.Aus.I.M.M.**

### General

It has been a tradition of the mining industry that, during industrial disputes, labour has been provided to cover essential services in mines. Two recent incidents indicate that this common-sense agreement has been abandoned. To protect the State's assets, mining companies should carry sufficient certificated staff to carry out these duties in compliance with the Regulations. I refer, in particular, to winder and stationary engine drivers and electricians.

### Incidents

A fire in the bearing box of an E.B.R. rail truck carrying explosives to the West Coast was observed and quickly dealt with by rail staff. All rolling stock, used for rail transport of explosives, will be inspected prior to the journey in future and will be equipped with roller type bearings.

## NORTH-EASTERN DISTRICT

**J. W. DEMPSTER, A.C.S.M., F.I.M.M., M.Aus.I.M.M., F.I.Q., C.Eng.**

### General

The economic slowdown continued to exert its influence on mining and its associated industries until the last two months of the year when a rise in demand for aluminium on the world market was recorded.

Small-scale alluvial tin mining is surviving in the North-East District on a reduced scale.

## SOUTHERN DISTRICT

**R. BILLINGHAM, B.Sc., A.R.S.M., A.M.Aus.I.M.M., M.I.Q.**

**P. ALLAN, B.Sc., A.H.-W.C., M.I.E. (Aus.), M.Aus.I.M.M., F.I.Q.**

**W. GRUN, A.C.S.M., D.I.C.**

The Branch continued to investigate complaints involving blasting operations and vibration damage, and to inspect mines, works and quarries. The offshore drilling rig which was active near Cape Sorell during the early part of the year was inspected.

Officers represented the Department on the Environmental Protection Advisory Council, the Standards Association Committee CE5 and the AMEC Standing Committee on Offshore Petroleum Legislation. Responsibility was accepted for the application of the Government Energy Management Programme as it affects the Department.

## DANGEROUS GOODS

### THE DANGEROUS GOODS ACT 1976

M. E. Curtain: Assistant Chief Inspector of Explosives
G. Jobson: Senior Inspector of Explosives

### Southern District —

R. A. Pickett: Inspector of Explosives
E. J. Garlick: Inspector of Explosives
C. G. Gardner: Inspector of Explosives
J. C. Goodrick: Magazine Keeper

NORTHERN DISTRICT —

D. R. Bonham: Inspector of Explosives (retired November 1982)

S. Smith: Inspector of Explosives

G. T. Dyer: Acting Magazine Keeper

NORTH-WEST DISTRICT —

H. E. T. Medwin: Inspector of Explosives

G. Hunt: Inspector of Explosives

Because of financial restraints, the number of field inspections of the handling and storage of dangerous goods fell by 15 per cent to 2 366, which was below the desirable figure.

During the year D. R. Bonham retired after twenty-four years of commendable service, S. Smith was appointed as Inspector of Explosives and G. Dyer as a temporary Magazine Keeper.

## STORAGE AND USE OF DANGEROUS GOODS

Plan approvals and licences to keep dangerous goods increased during the year, due mainly to the increased use and storage of L.P. gas in industrial and commercial premises.

A major event has been the construction and completion of the Boral, L.P. gas terminal at Devonport.

The growth in L.P. gas usage has been shown by the 62 per cent increase in imported L.P. gas from 11 439 tonnes in 1981–1982 to 18 584 tonnes in 1982–1983.

There has also been an increase in the storage and use of other Class 2 — Gasses, Class 3 — Flammable Liquids, Class 5 — Oxidising Agents and Class 8 — Corrosives.

There has been a small increase in the number of vehicles being converted to run on L.P. gas, while the number of autogas outlets remained steady.

## TRANSPORT OF DANGEROUS GOODS

Transport Tasmania, with the co-operation of the Department, has continued to implement a yearly inspection system for vehicles conveying dangerous goods.

All vehicles carrying petrol, kerosene and L.P. gas in bulk have been inspected and registered. The second phase of the system is presently being administered and includes all vehicles conveying more than the prescribed quantity of these products in drums and cylinders.

The Department issued restricted permits during the year for the conveyance of explosives and P.C.B. (polychlorinated biphenyls).

## MANUFACTURE OF DANGEROUS GOODS

Preliminary investigations were conducted at three premises.

## IMPORTS OF DANGEROUS GOODS

The section inspected and supervised all ship tanker imports of Class 1, 2·1, 3·1, 3·2 and 3·3 dangerous goods into the State.

Three shipments of Class 8 (caustic soda) were also inspected.

### Sale of Dangerous Goods

There was an increase in the number of licences to sell explosives including fireworks. The keeping and sale of fireworks was again firmly supervised by the Department.

### General

Inspection objectives included the updating of existing records for all dangerous goods and ensuring that correct abandonment procedures were carried out for disused underground flammable liquid tanks.

Inspection guidelines and check lists were improved.

The problem of obtaining outstanding licence fees was analysed and new procedures for 1983–1984 were drafted.

Lectures concerning the safe storage and use of dangerous goods were presented to schools, associations and statutory authorities.

Complaints regarding incorrect storage of dangerous goods were investigated and remedial action implemented.

On twenty-one occasions the Department collected and disposed of old or unwanted dangerous chemicals and explosives.

### Occupational Health

Assistance and advice was given to a number of firms and Departments concerning toxic chemicals. Two lectures were presented to statutory authorities.

### Committees

The Section was represented on the following committees:—

L.P. Gas Safety Committee.
ATAC's Advisory Committee for the Transport of Dangerous Goods by Road and Rail.
ATAC's Competent Authorities Committee for the Transport of Dangerous Goods by Road and Rail.
SAA ME/15 Liquefied Petroleum Gas.
SAA ME/17 Flammable and Combustible Liquids.
SAA CH/9 Safe Handling and Storage of Chemicals.
Building Regulations Board.
Hazardous Chemicals Committee.
Chief Inspector of Explosives Conference.

### Incidents and Accidents

Twenty-two incidents and accidents involving Dangerous Goods were investigated by the section were —

**Class 1 (Explosives)**

Fireworks caused burn injuries to an eleven year-old boy.

Fireworks thrown from a car landed in a barn and ignited hay.

Detonators exploded in a fireplace and a woman suffered facial cuts. It appeared that the detonators were in a bucket into which she collected sawdust and shavings.

**Class 2·1 (Flammable Gas)**

Fire damage was caused to a kitchen/family room due to a gas leak and fire at the bayonet fitting of a domestic gas heater.

A fire-explosion injured and hospitalised a driver of an L.P. gas-fuelled taxi which was also severely damaged. The incident was caused by the ignition of leaking gas from an overfilled gas cylinder which was not fitted with an 80 per cent fill limiting valve.

A motor vehicle powered by dual fuel system (L.P. gas/petrol) caught fire, investigation revealed that the vehicle has been operating on L.P. gas at the time of the incident and had changed over from petrol only moments before. The most likely cause of the fire was carburettor flooding.

Fire involving and L.P. gas system occurred at a private residence. An inspection revealed that the pipework and hot water heater had been installed correctly but a faulty gas regulator had allowed full cylinder pressure to pass through to the appliance.

A semi-trailer conveying 45 kg cylinders hit a roadside embankment. Twenty-five cylinders were dislodged but were undamaged.

A small flat-tray truck conveying an L.P. gas fuelled heating unit used for melting plastic-base road marking paint was gutted by fire. Investigation showed that the L.P. gas system was not correctly installed.

Two suspected L.P. gas odour-leaks were investigated.

**Class 2·2 (Non-flammable Gas)**

A fifty-eight tonne liquid nitrogen storage tank at a gas company depot leaked nitrogen gas to atmosphere, apparently caused by the malfunction of a protective bursting disc operating below its rated capacity due to ageing in normal use. The fire brigade attended and police stopped traffic north and south of the leak.

**Class 2·3 (Poison Gas)**

Fire-explosion and ammonia escape at industrial premises was caused during an annual overhaul involving removal of oil from the refrigeration system. The pilot flame of a propane torch ignited a mixture of ammonia and oil. An employee was admitted to hospital following inhalation of ammonia fumes.

**Class 3·1 (Flammable liquids)**

Heating a mixture of turpentine and linseed oil on an electric hot plate caused fire and severe burns to a man who was subsequently admitted to the intensive care ward of the public hospital.

Suspected spillage of petrol gave rise to complaints from city premises, the source of the spillage was not located but was thought to have resulted from a spillage and hosing down at a service station forecourt.

A major fire at a Golf Club premises where incorrectly stored flammable liquids, unidentified fertilisers and ammonium nitrate were being kept, resulted in minor injury to two persons. The fire started whilst a motor mower was being re-fuelled inside the premises.

Investigation of petrol odours in sections of Parliament House indicated that a leak from a parked vehicle had drained into the stormwater system.

Fire in a workshop was caused when a spark from a grinder ignited a cleaning rag which fell into an open 20-litre drum of commercial thinners.

The pipeline to an oil company tank farm was being water cleared from a tankship when the wharf line was overpressurised due to a ' stuck ' valve on the ship. Fortunately product discharge had been completed.

**Class 3·4 (Combustible liquids)**

A storage tank at an oil company tank farm suffered partial end collapse as product was being withdrawn. It appeared that the pressure and vacuum vent malfunctioned

Spillage occurred within the bunded area of a tank farm during cargo receipt from a tanker. The leak was due to a corroded test plug in the casing of a spade valve of the pipeline.

**Class 5·1 (Oxidising agents)**

A leak of hydrogen peroxide at industrial premises was due to a 25 kg metal drum being punctured by a fork lift truck.

## Dangerous Goods Statistics

### 1. Licences, permits, approvals issued for the import, manufacture, storage, use or sale of Dangerous Goods

| | |
|---|---|
| Licences to keep dangerous goods | 2 363 |
| Licences to sell explosives (including fireworks and safety cartridges) | 480 |
| Magazine Licences | 119 |
| Import Licences | 37 |
| Licences to convey | 20 |
| Licences to manufacture | 4 |
| Exemptions granted | 3 |
| Plans Approved | 420 |
| L.P. Gas Start Work Notices received | 767 |
| L.P. Gas Start Work Notices installations inspected | 580 |
| L.P. gas sub-standard installations for repair | 28 |
| Total No. approved installers autogas | 51 |
| Vehicles converted to autogas | 109 |
| Autogas outlets | 15 |
| Shotfirers' permits issued | 71 |

### 2. Imports of Class 2·1 and Class 3 Flammable Liquids

IMPORTS OF INFLAMMABLE LIQUIDS

| *Product (tonnes)* | *Bell Bay* | *Burnie* | *Devonport* | *Hobart* | *Total* |
|---|---|---|---|---|---|
| Aviation gasoline | 1 591 | .... | .... | 9 333 | 10 924 |
| L.P. Gas | 8 573 | .... | 5 052 | 4 959 | 18 584 |
| Motor Spirit — | | | | | |
| Regular | 7 159 | 3 373 | 4 553 | 14 337 | 29 422 |
| Premium | 68 899 | 31 957 | 60 183 | 136 851 | 297 890 |
| Kerosene — | | | | | |
| Aviation | 12 942 | .... | .... | 11 944 | 24 886 |
| Lighting and power | 1 432 | 545 | 1 007 | 1 967 | 3 519 |
| Bitumen feedstock | .... | .... | .... | 27 183 | 27 183 |
| A.G.O. and Distillate | 46 345 | 35 066 | 36 903 | 48 823 | 167 137 |
| Heating and fuel oil | 12 329 | 8 062 | 25 427 | 28 822 | 74 640 |
| Total | 157 838 | 79 003 | 133 125 | 284 219 | 654 185 |
| Number of Tankerships | 31 | 10 | 23 | 28 | 92 |

### 3. Imports of Class 1 (Explosives)

IMPORTS OF EXPLOSIVES

| *Product* | *Burnie* | *King Is.* | *Hobart* | *Smithton* | *Wynyard* | *Total* |
|---|---|---|---|---|---|---|
| Ammonium nitrate for ANFO (t) .... .... .... | 3 465 | .... | .... | .... | .... | 3 465 |
| Blasting explosives Class 1·1 D (cartons) .... | 27 178 | 389 | 3 840 | 27 | .... | 31 434 |
| Propellants Class 1·1 C (cartons) .... .... .... | 1 409 | 47 | 20 | 1 | 149 | 1 626 |
| Detonators Class 1·1 B (cartons) .... .... .... | 1 409 | 47 | 20 | 1 | 149 | 1 626 |
| Detonating fuse Class 1·1 D (cartons) .... .... | 206 | .... | .... | .... | .... | 206 |
| Explosives shipments — | | | | | | |
| General .... .... .... .... .... .... .... | .... | .... | .... | .... | .... | 40 |
| Fireworks — | | | | | | |
| Display .... .... .... .... .... .... | .... | .... | .... | .... | .... | 5 |
| General .... .... .... .... .... .... | .... | .... | .... | .... | .... | 5 |

The method of reporting explosives shipments has been amended to conform to the IMCO Classification and Compatibility Groups. This is in accord with Regulation 3 and Schedule III, Part II, 1 *(b)* of the Dangerous Goods Regulations 1976.

# REPORT OF THE MOUNT CAMERON WATER RACE BOARD

## FOR THE YEAR ENDED 30 JUNE 1983

THE MINISTER FOR MINES

We submit the report of the Mount Cameron Water Race Board for the year ended 30 June 1983.

Mr N. Petrie, the Manager of the Mount Cameron Water Race reported that two mines were supplied with water this year, compared with five last year. The average workforce on the mines was five.

The Manager, one full-time Channel Keeper and one part-time Channel Keeper were employed on the Race.

The year's work consisted of the usual scrubbing, forking and general patrol of the race system. A new bridge was constructed at the Chum Creek, with the help of Mr Vern Wood and his log skidder.

Except for a flash flood during the Christmas period which resulted in the flooding of the Musselroe mine and several small breaks in the Heads Section, the year was extremely dry. A great deal of time was taken up with patrol to ensure maximum flow. The Musselroe River was all but dry below the intake. The supply was kept full at all times.

A successful submission was made for Federal assistance under the wage pause scheme, for six months' work for four employees to clean the race from Chum Dam to Gladstone.

H. MURCHIE, Chairman.
V. WOOD, Member.
K. R. DAVEY, Member.

## MOUNT CAMERON WATER RACE SUSPENSE ACCOUNT

*Statement of Receipts and Payments for the Year Ended 30 June 1983*

| *Receipts* | 1982 $ | 1983 $ | *Payments* | 1982 $ | 1983 $ |
|---|---|---|---|---|---|
| Appropriation Act 1981–1982 (loss 1980–1981) | 27 875·62 | | Balance from last account | 27 975·62 | 26 454·22 |
| Appropriation Act 1982–1983 (loss 1981–1982) | .... | 26 454·22 | Salaries, wages and pay-roll tax | 36 014·22 | 36 093·77 |
| Sale of water — | | | Car allowance | 500·00 | 500·00 |
| Fixed scale | 9 564·00 | 9 552·00 | Manager, travelling allowance | .... | 143·83 |
| Royalty scale | .... | .... | Maintenance | .... | 397·74 |
| Domestic scale | 496·00 | .... | Other expenses | .... | 24·24 |
| Balance to next account | 26 454·22 | 27 607·58 | | | |
| | $64 389·84 | $63 613·80 | | $64 389·84 | $63 613·80 |

## MOUNT CAMERON WATER RACE

*Statistics for the Year Ended 30 June 1983*

| | *1982* | *1983* | | *1983* | *1982* |
|---|---|---|---|---|---|
| *Registered Rainfall (mm)* | | | *Production* | *Tonnes* | |
| Great Musselroe | 769·7 | 1 046·8 | Tin oxide produced — | | |
| Little Musselroe | 761·3 | 951·8 | Fixed scale | 31·25 | 30·0 |
| | | | Royalty scale | .... | .... |
| *Water Services* | | | *Employment* | | |
| Average number of claims supplied per week | 3 | 2 | Average per week — | | |
| Greatest number of claims supplied in any one week | 3 | 2 | Fixed scale | 7 | 6 |
| Sluiceheads supplied — | | | Royalty scale | .... | .... |
| Fixed scale | 788 | 720 | | | |
| Royalty scale | .... | .... | | | |

# REPORT OF THE RINGAROOMA AND CASCADE WATER BOARD

## FOR THE YEAR ENDED 30 JUNE 1983

THE MINISTER FOR MINES

We submit the report of the Ringarooma and Cascade Water Race Board for the year ended 30 June 1983.

Logs and debris were removed from the by-washes and floodgate of the Cascade dam and valves were oiled and maintained.

There was a proposal to take over the Cascade dam for irrigation purposes which resulted in an inspection by parliamentarians and representatives of the news media.

Measures were taken to ensure the safety of the Mount Paris dam which was the subject of public comment.

If the Winnaleah irrigation scheme proceeds the Mount Paris dam should be maintained as a supplement.

The Board would be quite willing to relinquish both dams if a suitable use could be found.

H. MURCHIE, Chairman.
N. P. EDWARDS, Member.
K. R. DAVEY, Member.

## RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT

*Statement of Receipts and Payments for the Year Ended 30 June 1983*

| *Receipts* | 1982 $ | 1983 $ | *Payments* | 1982 $ | 1983 $ |
|---|---|---|---|---|---|
| Appropriation Act 1981–1982 (loss (1980–1981) .... .... .... .... | 2 095·89 | | Balance from last account .... .... | 2 095·89 | 1 675·63 |
| Appropriation Act 1982–1983 (loss 1981–1982) .... .... .... .... | .... | 1 675·63 | Allowances .... .... .... .... .... | .... | 150·00 |
| Balance to next account .... .... | 1 675·63 | 1 987·62 | Interest on capital cost .... .... | 1 675·63 | 1 837·62 |
| | $3 771·52 | $3 663·25 | | $3 771·52 | $3 663·25 |

A. B. CAUDELL, Government Printer, Tasmania