



1975

PARLIAMENT OF TASMANIA

DIRECTOR OF MINES

REPORT FOR THE YEAR ENDED 31 DECEMBER 1974

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

By Authority:

T. J. HUGHES, Government Printer, Tasmania



Underground mining at Renison Bell.

Photo: The Advocate

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REPORT OF THE DIRECTOR OF MINES

Department of Mines,
Hobart, 1 July 1975

THE MINISTER FOR MINES

I present my Report on the mining industry for the year ended 31 December 1974.

The value of metals and minerals produced from Tasmanian ores based on Australian metal prices was \$177 327 923 as compared with \$139 557 052 for 1973, representing an increase of 27%. In addition metallurgical production from ores and concentrates imported to the State was \$145 802 921 compared with \$114 645 092 for 1973, an increase of 27%. The total value of the industry surpasses the 1973 record by \$68 928 700.

The production of copper, gold, silver, tin and zinc recorded increases but the production of iron ore pellets, lead and tungstic oxide was less than last year.

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

Commodity	1973		1974	
	Quantity	Value \$	Quantity	Value \$
Copper (tonnes)	25 329	32 176 630	28 441	35 837 416
Gold (kilograms) ..	1 319	2 987 891	1 385	5 118 359
Iron ore pellets (tonnes)	2 413 781	27 656 607	2 230 197	26 475 112
Lead (tonnes)	14 372	4 091 160	12 637	5 048 404
Silver (kilograms)	60 080	3 553 503	62 093	7 169 721
Tin (tonnes) ..	5 674	20 221 559	5 951	34 221 518
Tungsten as tungstic oxide (tonnes)	1 502	4 491 751	1 302	7 876 323
Zinc (tonnes)	52 149	22 451 078	53 803	30 973 172

DEVELOPMENTS

All the major mines continued with policies of upgrading production and of improving metallurgical treatment processes to obtain improved recoveries of mineral products. Active programs of exploration within mining leases and on areas held under licence were maintained.

The year has been notable for very significant increases in prices for metals particularly in the second half of the year. The tin export quota was lifted in September 1973. This added to the profitability of operations although inflation generally and particularly wage increases has added considerably to production costs. The doubling of the price for wolfram and scheelite concentrates has encouraged the more rapid development of underground mining at the Dolphin and Bold Head mines being opened by King Island Scheelite; and the Storeys Creek mine which had been placed on a maintenance basis has returned to production of wolfram-tin ores. Installation of a heavy media separation process at the Renison tin mine is proceeding and is expected to be commissioned in 1975 and result in a significant increase in production.

Studies are continuing on the commercial development of a large silica deposit discovered by Comalco at Cape Sorell on the West Coast. There have been no positive developments on the establishment of a steel industry based on the Savage River iron ore deposits. The project remains under active investigation.

It is pleasing to record that following investigations on an area at Tonganah held under exploration licence by Associated Pulp and Paper Mills Ltd, a project for the extraction and processing of clay has been established, at a cost of about \$2 million. The plant will supply 20 000 tonnes of filler clay to APPM's mills at Burnie and Wesley Vale and will replace clay previously imported from Great Britain and the United States. The company is continuing its search for coating clay and investigations are proceeding around Tonganah and in the Gladstone district.

During the year a discovery of a zinc-lead deposit was made by Cominco Exploration Pty Ltd at Mt Charter on the West Coast. Assays of samples have given encouraging results. Investigations are proceeding and could result in active mining operations being established.

At the old Razorback Mine at Dundas, Minops Pty Ltd are in process of installing a milling plant.

Consolidated Goldfields Australia Ltd who have an option over the Australian Commonwealth Carbide Works at Electrona are actively investigating a silica deposit on the Weld River which could form a source of raw material for use in the production of silicon alloys, such as ferro-silicon, at the Electrona works.

The production of rutile and zircon concentrates has continued at King Island. The current high market price for zircon is directing attention to beach sand deposits on the East Coast where concentrates of zircon have been recorded by previous investigations.

An expansion program involving the construction of ninety smelting furnaces (half pot line) and installation of an additional facility to cast primary aluminium is being undertaken by Comalco Limited at Bell Bay at an estimated capital outlay of \$20 million. It is scheduled for completion at the end of 1975 and will increase the capacity of the plant from 95 000 to 114 500 tonnes.

At the plant at Bell Bay operated by the Tasmanian Electro-Metallurgical Co. it is proposed to install two new furnaces to manufacture manganese alloys and ferro-silicon and to provide a central plant for the agglomeration of fine ore. The work is expected to be completed at the end of 1975 at a cost of \$28.5 million. It will double the output of the present plant and make Australia self sufficient in ferro-silicon.

At Heybridge, Tioxide Pty Ltd are to expend \$4.2 million to improve and upgrade the plant which will include steps to reduce the iron content of the liquid effluent and methods to control gas emission.

Goliath Portland Cement at Railton are proceeding with a \$10 million program to double production capacity to 1 000 000 tonnes a year.

The Electrolytic Zinc Company at Risdon is planning to phase out its existing four flash roasters and has commenced the installation of a new concentrate fluid bed roaster. This will improve recoveries and add to the production of zinc.

PRODUCTION

The major producer of copper is the Mount Lyell Mining and Railway Co Ltd, Queenstown but the Electrolytic Zinc Co. at Rosebery and Cleveland Tin N.L. at Luina are also important producers.

The Mount Lyell Company treated 2.3 million tonnes of ore for the production of 100 187 tonnes of copper concentrate containing 25 352 tonnes of copper, 5 217.376 kilograms of silver and 492.764 kilograms of gold. The copper concentrates are transported by road to Melba Siding and thence by rail to Burnie for shipment to Port Kembla and Japan. Pyrite concentrates are processed by North-West Acid Pty Ltd at Burnie for the manufacture of sulphuric acid. Apart from some half-million tonnes of surface ore, production was from underground mining.

Exploration drilling was continued and a re-assessment of ore reserves has indicated proved ore totalling 29.9 million tonnes averaging 1.47% copper, 1.914 grams of silver and 0.313 grams of gold per tonne. Probable ore increased to 10.6 million tonnes averaging 1.4% copper, 1.75 grams of silver and 0.25 grams of gold per tonne and possible ore was calculated at 109 million tonnes of an average grade of 1.28% copper, 3.06 grams of silver and 0.30 grams of gold per tonne.

The expansion program commenced in 1968 was continued but was retarded because of the shortage of skilled labour and the downward trend in the price of copper which became evident towards the end of the year.

The Electrolytic Zinc Company produced 2 555 tonnes of copper from its treatment of zinc lead ores and Cleveland Tin N.L. recovered 534 tonnes of copper from its tin mining operations at Luina.

Iron ore pellets produced by Savage River Mines from the mining of iron ore at Savage River totalled 2 230 197 tonnes which are shipped to steel mills in Japan under contract.

Tin produced amounted to 5 951 tonnes and Renison Limited and Cleveland Tin N.L., the two leading tin mines in Australia, were responsible for the major part of the production.

Renison Limited produced 9 151 tonnes of tin concentrates containing 3 918 tonnes of metallic tin from the mining of 488 492 tonnes of ore averaging 1.37% tin. The overall recovery was 69.4% which was slightly below the 1973 value. The decline in recovery was due to the lower grade of ore treated, some industrial unrest and to the difficulty of recruiting and maintaining a stable labour force. During the year a computer control of the primary grinding circuit was installed and a new cyclone was provided on the slime tailings stream which recovers fine tin in the cassiterite flotation section. Towards the end of the year a start was made on commissioning a heavy media separation plant which will enable the capacity of the existing mill to be increased to 700 000 tonnes per annum.

Diamond drilling to outline ore reserves was continued. Proved reserves were assessed at 5.05 million tonnes containing 1.47% tin and probable reserves were fixed at 4.28 million tonnes averaging 1.24%. Possible ore was estimated at 7.6 million tonnes expected to average 1.13% tin.

The company has continued to provide additional housing for its employees at Zeehan.

At the Cleveland Mine at Luina, production consisted of 2 582 tonnes of concentrates containing 1 594 tonnes of tin and 534 tonnes of copper from the mining and milling of 319 211 tonnes of ore. Surface exploration of the company's leases has been completed and a program of deep diamond drilling has been undertaken to determine ore reserves. Indicated ore has been calculated at 2.25 million tonnes averaging 0.82% tin and 0.34% copper. Exploration and drilling of areas adjacent to the leases is continuing.

At the Storeys Creek and Aberfoyle mines 44 162 tonnes of ore were treated for the recovery of 285 tonnes of tin concentrates containing 210 tonnes of metallic tin and 159 tonnes of wolfram concentrate.

The Ringarooma Tin Mining Co. Pty Ltd operating on tin-bearing wash at the old Mt Bischoff Tin Mine at Waratah treated 71 000 cubic metres of ground for the recovery of 175 tonnes of concentrates containing 70 tonnes of tin.

Tin mining remains an important industry in the north-east of the State and sales by eight of the largest producers amounted in total to 81 tonnes of metallic tin. However, exploration activities which are essential for the long-term future of tin mining in the north-east have not been undertaken to any significant degree and producers have relied on known deposits which, without continuous active programs of exploration, cannot support growth of the present scale of mining operations.

The only producers of tungstic oxide are King Island Scheelite which mines scheelite at King Island and the Storeys Creek and Aberfoyle mines which produce wolfram concentrates from the mining of wolfram-tin ores at Storeys Creek and Rossarden.

At the King Island Scheelite mines 299 000 tonnes of ore were treated for the production of 1 143 tonnes of tungstic oxide. Ore from the Storeys Creek and Aberfoyle mines are treated at the Aberfoyle mill at Rossarden where 44 162 tonnes of ore were processed for the recovery of 159 tonnes of tungstic oxide and 210 tonnes of tin.

At the King Island Scheelite mine production of ore from the open-cut ceased in October 1974 and underground mining is now taking place at the Dolphin mine beside the open-cut. It is reported that the Dolphin orebody could contain 7 million tonnes of ore and at Bold Head 2.7 million tonnes could be available.

King Island Scheelite Ltd, which has changed its name to Warman International Limited has maintained a progressive exploration program both on the leases and in other areas at King Island.

The Electrolytic Zinc Company of Australasia Limited treated 492 427 tonnes of ore principally from the Rosebery mine with some small tonnages from the Hercules and Farrell mines and from old dumps for the recovery of 115 635 tonnes of zinc concentrate, 12 402 tonnes of lead concentrates containing lead, silver and gold and 22 257 tonnes of copper concentrates containing copper, lead, silver and gold, containing a total of 53 803 tonnes of zinc, 12 635 tonnes of lead, 56 422 kilograms of silver and 890 kilograms of gold. A total of 115 869 tonnes of pyrites was produced. This is the raw material for the production of sulphuric acid by North-West Acid Pty Ltd at Burnie which is jointly owned by the Electrolytic Zinc Company and Mt Lyell Mining and Railway Company Ltd.

Ore reserves were assessed at 9 million tonnes consisting of 8.6 million tonnes at the Rosebery mine; 314 000 tonnes at the Hercules mine and 71 000 tonnes at the Farrell mine at Tullah.

Output of zinc at the company's Risdon plant which treats zinc concentrates from Rosebery and imported concentrates from the Broken Hill mines was 120 673 tonnes which represents a considerable decline from the 1973 production of 132 556 tonnes. The fall has been attributed to a three-week industrial stoppage. Since the close of the year there has been a serious decline in the world demand for zinc and this has resulted in restrictions on production and some retrenchment of staff.

METAL PRICES

The following table shows the average metal prices for 1974. It will be noted that significant increases were recorded which is reflected in the record value of the industry. However an examination of market trends shows that the price of copper, lead, silver and tin were declining towards the end of the year.

AVERAGE AUSTRALIAN PRICES, 1973-1974 (\$A)

Commodity	Unit	1973	1974
		\$	\$
Copper	tonne	1 252.66	1 273.33
Gold	kilogram	2 247.00	3 692.03
Lead	tonne	280.50	399.17
Silver	kilogram	58.35	115.21
Tin	tonne	3 532.00	5 775.25
Tungsten	tonne	30.17	62.31
Zinc	tonne	425.50	582.00

Copper

The domestic price of copper which was \$1 380 per tonne at the beginning of the year was increased to \$1 460 per tonne by the Copper Producers Association which held the price at this level until July when it declined to \$1 280 in line with the downturn in prices on the London Metal Exchange. This decline continued and reached a low of \$1 000 per tonne in December. The trend has continued into 1975 and has seriously affected the profitability of operations by the Mt Lyell Co. at Queenstown. The impact was cushioned by a policy of forward selling but because of high stocks of metal on the world market and a lack of demand by consumers conditions are not favourable for an improvement in the price.

Tin

The price of tin has shown a dramatic increase for 1974 compared with 1973 when the market was over supplied and quotas were imposed to limit production. This has resulted from a substantial increase in tin consumption without a consequent rise in production. The International Tin Council, of which Australia is a producer member, revised price ranges for the buffer stock operations to prevent uncontrolled price fluctuations. The Australian price which is based on the Malaysian price ranged from a low of \$3 966 per tonne to a high of \$6 860 per tonne compared with an average of \$3 532 per tonne for 1973. The price payable to producers is quoted daily per metric tonne unit for 70% concentrates and represents the

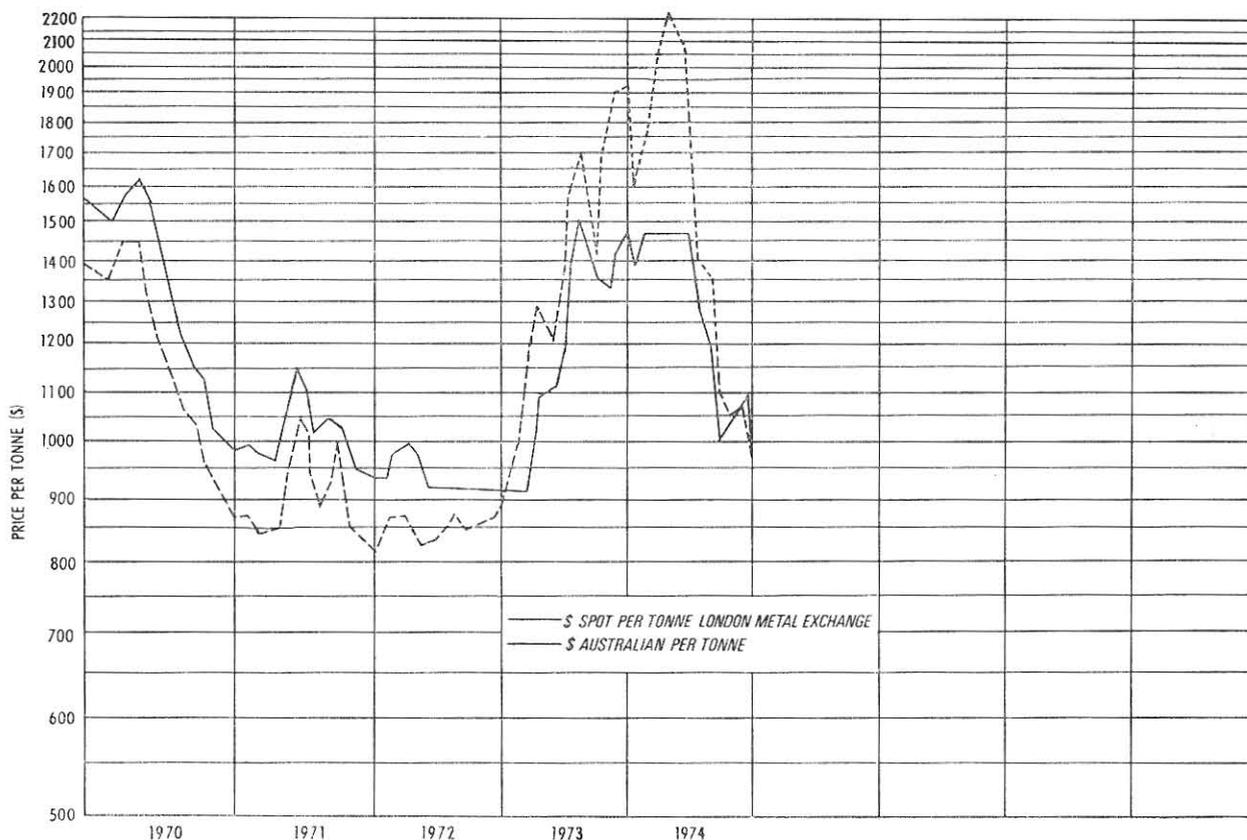
Australian price of tin less a deduction for smelting and other charges. This price ranged from a low of \$33.80 per unit at the beginning of January and reached a high of \$60.51 per unit at the end of April. It was quoted at \$44.42 per unit at the end of the year. This has benefited Tasmanian producers.

Tungsten

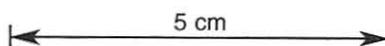
The nominal price on the London Metal Exchange at the beginning of the year was £22.25 per unit of contained tungstic oxide which was a continuation of 1973 prices which had resulted in a cessation of mining of wolfram-tin ores at the Storeys Creek mine and the retarding of development of new orebodies at the King Island Scheelite mine. A sharp increase in the London Metal Exchange price occurred in April when the price ranged from £26.35-£36 per unit. This was continued in the following months and a high of £50 per unit was maintained during most of September and October when there was a gradual decline to £38 per unit at the end of the year. There has been an upward trend to £42.50 per unit in the early months of 1975. In Australian currency this represented a range over the year from a low of \$31.82 per unit to a high of \$86.93 per unit. The result has been the re-opening of the Storeys Creek mine and the more rapid development of two underground operations at the King Island Scheelite mine.

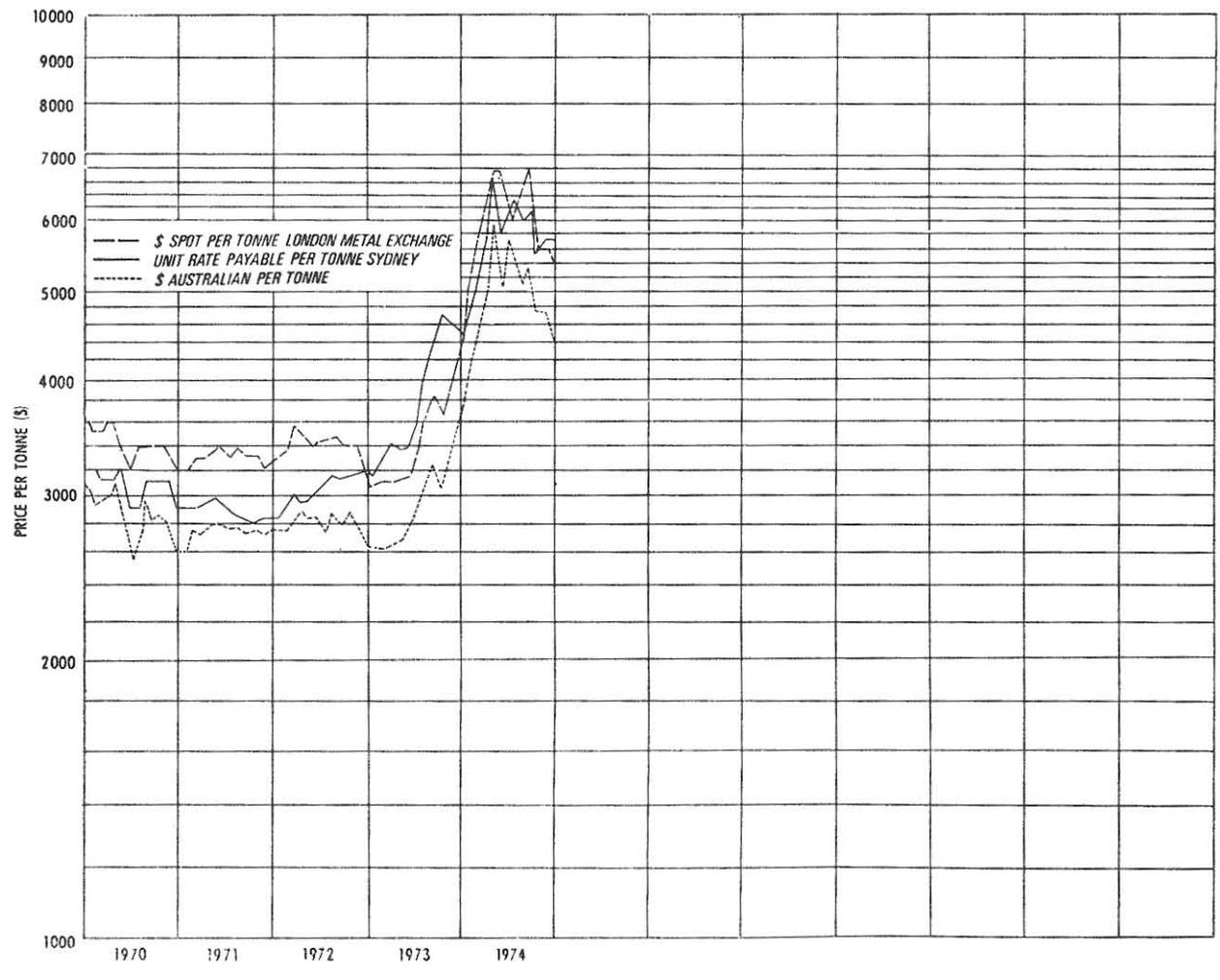
Zinc

The price ranged from \$484 per tonne at Risdon in the first quarter of the year to \$672 per tonne in the last four months of 1974. Since the close of the year there has been a fall in demand by consumers and this has caused serious economic problems for the Electrolytic Zinc Co. at Risdon which is reducing production and retrenching employees.

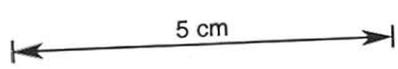


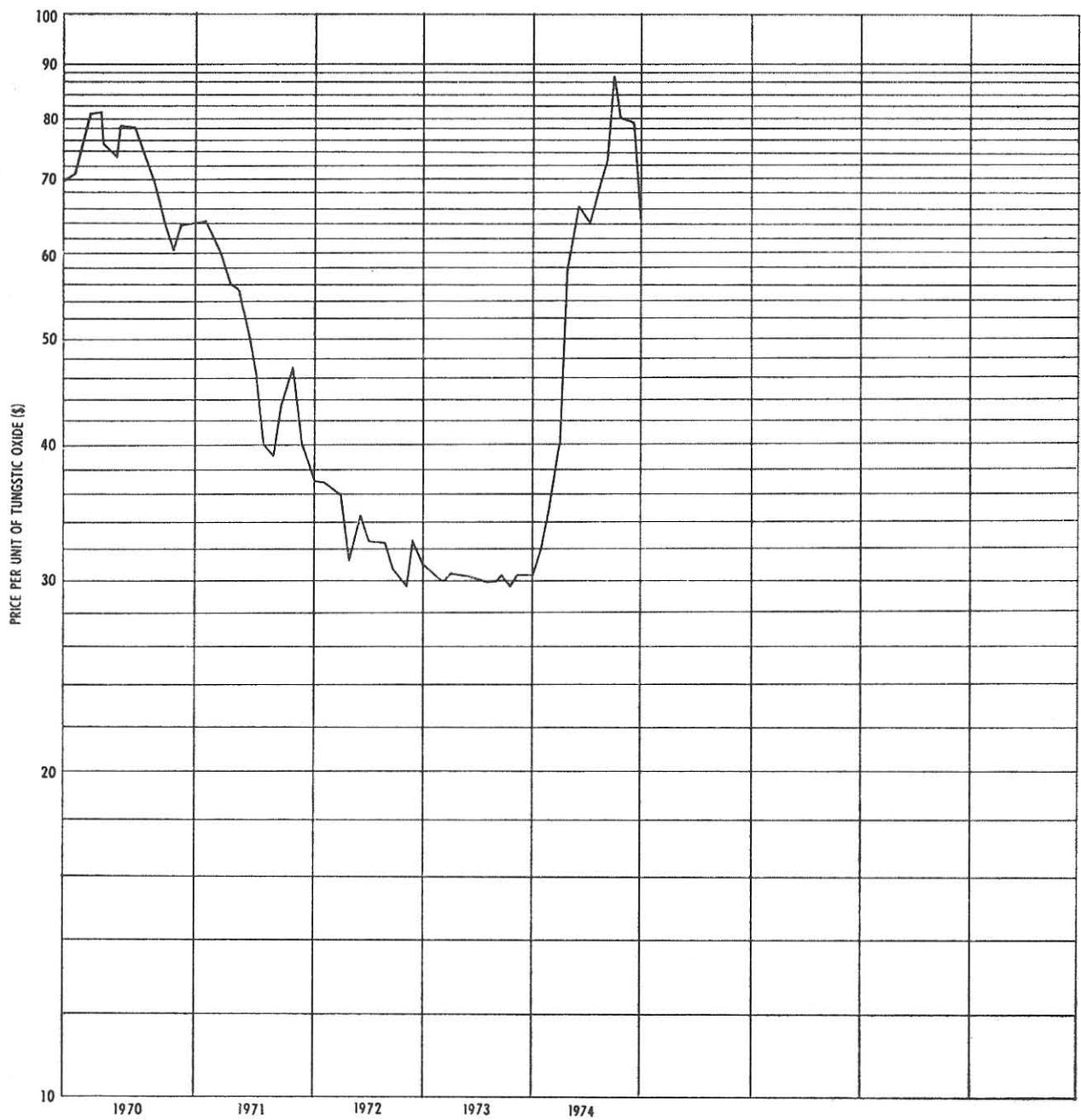
COPPER PRICES
MONTHLY AVERAGES, 1970-1974





TIN PRICES
MONTHLY AVERAGES, 1970-1974





TUNGSTEN PRICES
MONTHLY AVERAGES, 1970-1974

5 cm

EXPLORATION

Well established companies having available financial resources have maintained active programs of exploration for minerals mainly in the western and north-western areas of the State, and all the companies operating major Tasmanian mines have undertaken exploratory work outside existing mining leases as well as continuing programs of investigation within their leases. At the end of the year fifty-seven exploration licences covering 8 482 square kilometres and eleven special prospector's licences in respect of a total area of 385 square kilometres were in force. In addition four permits to explore for petroleum in Bass Strait were held.

Continuing exploration is essential for the future of the mining industry and it is pleasing to record the continued interest of major mining companies in searching for new mineral discoveries and additions to known mineral occurrences.

The Department's policy of requiring holders of licences to relinquish areas on which active programs of work are not being undertaken is resulting in land being made available for investigation by other interested companies.

The Department has maintained its established program of regional geological mapping, economic geology, groundwater investigations and engineering geology. Publications of maps and reports are made regularly for the information of interested persons and professional staff are always available to assist and advise the mining industry. Departmental publications and information by former exploration licence holders when placed on 'open file' are in constant demand by mining companies and other holders and potential holders of exploration licences.

The Department's drilling plants are engaged in testing mineral deposits and in the investigation and measurement of underground water resources in selected areas. In addition to groundwater studies, the Department is continuing with the testing of coal measures in the Fingal Valley. Other drilling has consisted of stratigraphic boring for geological purposes, foundation testing and investigation of limestone and tin deposits. The results of departmental work are published and core samples are made available for examination by interested parties.

COAL

The Cornwall Coal Co. which operates the Duncan mine at Fingal was the only producer. A total of 127 460 tonnes was mined in 1974 which is consistent with annual production for several years. The coal mining industry suffered a decline from 1961 due to competition from oil and operations have since been sustained principally because of the newsprint industry's continued use of coal. The recent 'oil crisis' and escalating prices have revived interest in the use of Tasmanian coal in industry and it is pleasing to record that Goliath Portland Cement Co. at Railton has decided to revert to the use of coal. It is expected that 60 000 tonnes per annum will be required by the end of 1975 and when a new kiln is installed a further 60 000 to 80 000 tonnes per annum will be required. This will result in more than doubling of the present coal output in the next few years. The Cornwall Coal Co. is equipping its mine to meet the increased demand.

The Department has been engaged in drilling in the Fingal Valley to test the coal resources and establish reserves to support future demands for coal for industrial purposes. Technical drilling difficulties have resulted in slow progress, but the Department has two drilling plants allocated to the work and has operated on a two-shift basis except during the winter. Inferred coal reserves in the Fingal Valley based on fragmentary data amount to 85 million tonnes but this figure cannot be regarded as reliable and a substantial drilling program is necessary to establish proved reserves.

Interest has also been shown by two companies in examining known coal resources on the East Coast and in the Catamaran area.

OIL

Magellan Petroleum Australia Ltd the holder of exploration permit T/9P consisting of four blocks at the eastern end of Bass Strait surrendered the permit in July 1974. The remaining five permits which collectively cover the whole of Bass Strait expired in July having been in force for six years in accordance with the provisions of the Petroleum (Submerged Lands) Act 1967. The holders are required by the legislation to relinquish one-half of the blocks held under the original permit when applying for a renewal which can be granted for five years. The applications for renewal were submitted to the Commonwealth in accordance with clause 11 of an Agreement for a Common Mining Code between the Commonwealth Government and the Governments of the States. Because of pending High Court challenges by some of the States to the Commonwealth Seas and Submerged Lands Act 1973 the Commonwealth deferred any decision on the applications for extensions of the permits. Tasmania considered that the Agreement which provides that the Commonwealth Government will give a decision 'with all due expedition' had not been satisfied and that the deferment by the Commonwealth was not defined as a Commonwealth responsibility in the Agreement. In such circumstances Tasmania decided to proceed with the issue of the renewals. Magellan Petroleum Australia Pty Ltd did not continue with its application for an extension of permit T/1P of forty-one blocks.

The following extensions were granted:—

<i>Title</i>	<i>Title Holder</i>	<i>Blocks</i>	<i>Location</i>	<i>Expiry Date</i>
T/3P	Hematite Petroleum Pty Ltd	171	Bass Strait	16.7.79
T/4P	Hematite Petroleum Pty Ltd	85	Bass Strait	16.7.79
T/5P	Hematite Petroleum Pty Ltd	65	Bass Strait	16.7.79
T/6P	Hematite Petroleum Pty Ltd	154	Bass Strait	16.7.79

Geophysical surveys and drilling were continued by Hematite Petroleum Pty Ltd in Bass Strait. Three bores were sunk by the company but without success. Further geophysical work and drilling is planned.

Particulars of the drilling is as under:—

<i>Name of Bore</i>	<i>Location</i>	<i>Period of Drilling</i>	<i>Final Depth (m)</i>	<i>Result</i>
Toolka—1A	Lat. 39° 24' 36" Long. 145° 23' 45"	14.1.74 to 5.2.74	2 715	Unsuccessful
Aroo—1	Lat. 39° 47' 31" Long. 145° 26' 48"	4.3.74 to 19.4.74	3 692	Unsuccessful
Nangkero—1	Lat. 40° 04' 24" Long. 145° 58' 42"	24.4.74 to 15.5.74	2 877	Unsuccessful

LEGISLATION

No amendments to the Acts administered by the Department were made but amendments were made to regulations as follows:—

Aid to Mining Regulations—The regulations were amended by Statutory Rules 1974, No. 41 to convert imperial measurements to metric units.

Explosives Regulations—Amendments were made by Statutory Rules 1974, No. 178 to provide certain new procedures relating to ships carrying explosives and to convert imperial measurements to metric units.

MINING AND THE ENVIRONMENT

The Director of Mines is a member of the Environment Protection Advisory Council established under the Environment Protection Act 1973 and the Chief Chemist and Metallurgist (Mr H. K. Wellington) serves on a technical committee concerned with pollution control. All our mining engineers engaged in mine inspectorial duties are authorised officers under the legislation which supplements their authority under the Mines Inspection Act to control methods of mining.

All applications for mining tenements are examined and reported on by one of our mining engineers who assists the applicant to prepare an environmental impact study. This is used both for fixing the conditions for the issue of a lease or licence under the Mining Act and for the purposes of a licence to operate under the

Environment Protection Act. The liaison established between this Department and the Department of the Environment has functioned well and has been an important factor in applying conditions of environmental control throughout the mining industry.

The mining industry has co-operated well in its acceptance of the principles of environmental control and there has been considerable expenditure in adopting control measures to prevent pollution and in rehabilitating mined areas. It is significant that companies investigating the development of mineral deposits are making environmental requirements an essential part of feasibility studies and planning of productive mining. This is a considerable advance and it has been achieved by the industry over a period of two to three years. I think it can be stated with confidence that the former laissez-faire attitude towards the development of the natural resources of the State is now history and that the future will see continuing advances on the progress already made. I hope that as time goes on, mining, which is opposed in many quarters apparently as a matter of principle, will be accepted and recognised as a most responsible industry and as one of the major factors in Tasmania's economy.

It will be the continuing policy of this Department to require all holders of mining tenements to adopt practices which will result in minimum disturbance of the environment consistent with mining and to rehabilitate mined areas to acceptable standards.

Continuing pressure is being exerted by preservationists who call themselves conservationists, to prevent the utilisation of the natural resources in large areas of the State.

Large areas of Tasmania consist of rock types of geological age known to be hosts to mineralisation, but due to lack of exploration and the inability of existing scientific equipment to locate orebodies at depth the discovery of such ore deposits will have to await the development of more sophisticated techniques.

AUSTRALIAN MINERALS COUNCIL

The Council consisting of Ministers for Mines of the States and Commonwealth Ministers was formed in 1968 to promote the general and progressive development of the Australian mining and mineral industry.

Regular meetings of the Council and its Advisory Committee comprising Heads of the States Mines Department and Commonwealth representatives were held but there has been no meeting since October 1972, as a result of Commonwealth Government policy. There have been moves by some of the States to revive the Council or form another body with similar objects but there have been no positive developments.

REVENUE

REVENUE COLLECTED DURING THE YEAR ENDED 31 DECEMBER 1974

<i>Heads of Revenue</i>		\$
Public Works and Services—Mines Department	.....	87 012
Rent and fees of Auriferous and Mineral Lands	.....	170 669
Royalty on Iron Ore Pellets	.....	339 328
Survey Fees	.....	6 861
Fees under the Explosives and Inflammable Liquids Act	.....	45 159
TOTAL	.....	<u>649 029</u>

COMPARATIVE STATEMENT OF REVENUE FROM MINES, BEING RENTS, FEES, STORAGE OF EXPLOSIVES, ETC., PAID TO THE TREASURY DURING THE YEARS 1968 TO 1974

<i>Year</i>	\$	<i>Year</i>	\$
1969	445 712	1972	563 816
1970	528 666	1973	641 380
1971	597 937	1974	649 029

The above statement does not include Stamp Duties upon Transfer of Leases.

LEASES AND LICENCES

NUMBER AND AREA OF NEW LEASES AND LICENCES ISSUED DURING THE YEAR ENDED
31 DECEMBER 1974

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Clay	3	16	....
Coal	5	380	....
Copper	1	32	....
Easements	12	151	....
Gold	9	239	....
Gravel and sand	7	511	....
Granite	1	2	....
Minerals	7	935	....
Silica	3	54	....
Silver-lead and zinc	3	17	....
Stone	20	1 910	....
Tin	44	4 294	....
Water licences	11	48	79
TOTAL ..	126	8 589	79

TOTAL NUMBER OF LEASES AND LICENCES IN FORCE ON 31 DECEMBER 1974

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Antimony	2	65	....
Bauxite	5	143	....
Clay	19	291	....
Coal	14	1 900	....
Copper	14	2 370	....
Dolomite	3	125	....
Gold	37	636	....
Granite	2	6	....
Iron ore	15	1 812	....
Kaolin	6	307	....
Limestone	17	817	....
Marble	2	30	....
Minerals	15	1 036	....
Ochre	2	3	....
Osmiridium and chromite	6	243	....
Nickel	1	32	....
Sand and gravel	39	3 600	....
Scheelite	1	2 689	....
Silver-lead and zinc	35	3 505	....
Slate	1	15	....
Stone	72	4 083	....
Tin	365	9 224	....
Wolfram and tin	53	3 395	....
Water licences	124	445	946
Easements	67	903	....
TOTAL ..	917	37 675	946

NUMBER AND AREA OF LEASES AND LICENCES APPLIED FOR DURING THE YEAR ENDED
31 DECEMBER 1974

<i>Leases and Licences</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
Clay	3	115	....
Coal	3	338	....
Copper	11	786	....
Dolomite	1	4	....
Gold	10	480	....
Granite	1	15	....
Gravel and sand	4	67	....
Kaolin	5	294	....
Limestone	2	77	....
Minerals	7	332	....
Osmiridium	1	192	....
Silica	6	428	....
Silver-lead and zinc	3	150	....
Stone	19	639	....
Tin	47	1 411	....
Wolfram	1	16	....
Zircon	7	63	....
Water	17	104	37
TOTAL	148	5 511	37

TOTAL NUMBER OF ALL TYPES OF PROSPECTING RIGHTS HELD AS AT
31 DECEMBER 1974

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Permits to enter and search on private land, including owners' consents	10	442 km ²
Exploration licences	57	8 482 km ²
Special Prospector's licences	11	385 km ²
Miners Rights	90	22 ha
Prospectors licences	129	4 200 ha
Authorities to prospect under the Aid to Mining Act 1927	1	23 km ²
Permits to explore for petroleum under the Petroleum (Submerged Lands) Act 1967	4	475 graticular blocks (28 595 km ²)

Exemptions

Exemption from the labour covenant of leases is rarely granted, and is only granted in circumstances where it can be shown that compliance is beyond the control of the lessees.

Northern Chromite Pty Ltd was granted an exemption on lease 67M/72 at Beaconsfield. The Electrolytic Zinc Co. of Australasia Ltd, the holders of leases 11292/M, 11257/M, 7191/M and 32M/48 covering the Farrell mine at Tullah, was also given an exemption.

WARDENS' COURT

Tasmanian Conservation Trust and others v. Mineral Holdings Australia Pty Ltd. Objection to an application for a Special Prospector's Licence in the vicinity of Milford Creek and New River Lagoon.

This action which was heard by the Warden of Mines, Devonport, in 1972 went on appeal to the Supreme Court. Mr Justice Nettlefold reversed the finding of the Warden of Mines who had upheld the objections. A further appeal to the Full Court has been heard but no finding has yet been given.

Allstate (Tas.) Pty Ltd v. Estate of late H. D. Windred. Application for forfeiture of lease 1517/G, Beaconsfield.

This is the second application, the first having been adjourned *sine die* because of legal technicalities. A determination has not yet been made.

D. L. Nichols v. R. and V. Monty. Application for forfeiture of leases 1M/59, 4M/59 and 1W/59, Coles Bay.

This application was forwarded to the Warden of Mines, Hobart, for hearing, but the objectors have not proceeded with the action to date.

Tasmanian Conservation Trust v. P.J.V. Development Pty Ltd. Objection to application for Special Prospector's Licence, Arthur River.

The objection, which was forwarded to the Warden of Mines, Devonport, was later withdrawn.

E. M. Baker, R. S. Collins and A. L. Dabner v. Hobart Quarries Pty Ltd. Objection to application for lease 875P/M, Giblin Street, Hobart.

This application, forwarded to the Deputy Warden of Mines, Hobart, acting for the Warden of Mines for the South-Western Mining District, was later withdrawn.

F. Mihajlowitz v. J. D. Murray. Application for forfeiture of lease 47M57, Dundas.

This application was heard by the Deputy Warden of Mines, Burnie, acting for the Warden of Mines for the North-Western and Western Mining District at Devonport. The lease was declared forfeited with costs of \$50 against the defendant.

H. N. Thomas v. J. M. Dwyer. Application for forfeiture of lease 100M/68, Mathinna.

The application was heard by the Warden of Mines at Launceston but was dismissed on technical grounds. A subsequent application was partly heard and adjourned.

MINE MANAGERS' CERTIFICATES

Metalliferous Mine Managers' Certificates were issued by the Board of Examiners under the Mines Inspection Act 1968 as follows:—

By examination viva voce—

Certificate No.

234/74 Iain MacGregor

235/74 Brian Edward Hopwood

Certificate Issued Upon Presentation of a Certificate

Issued by a Recognised Authority—

Certificate No.

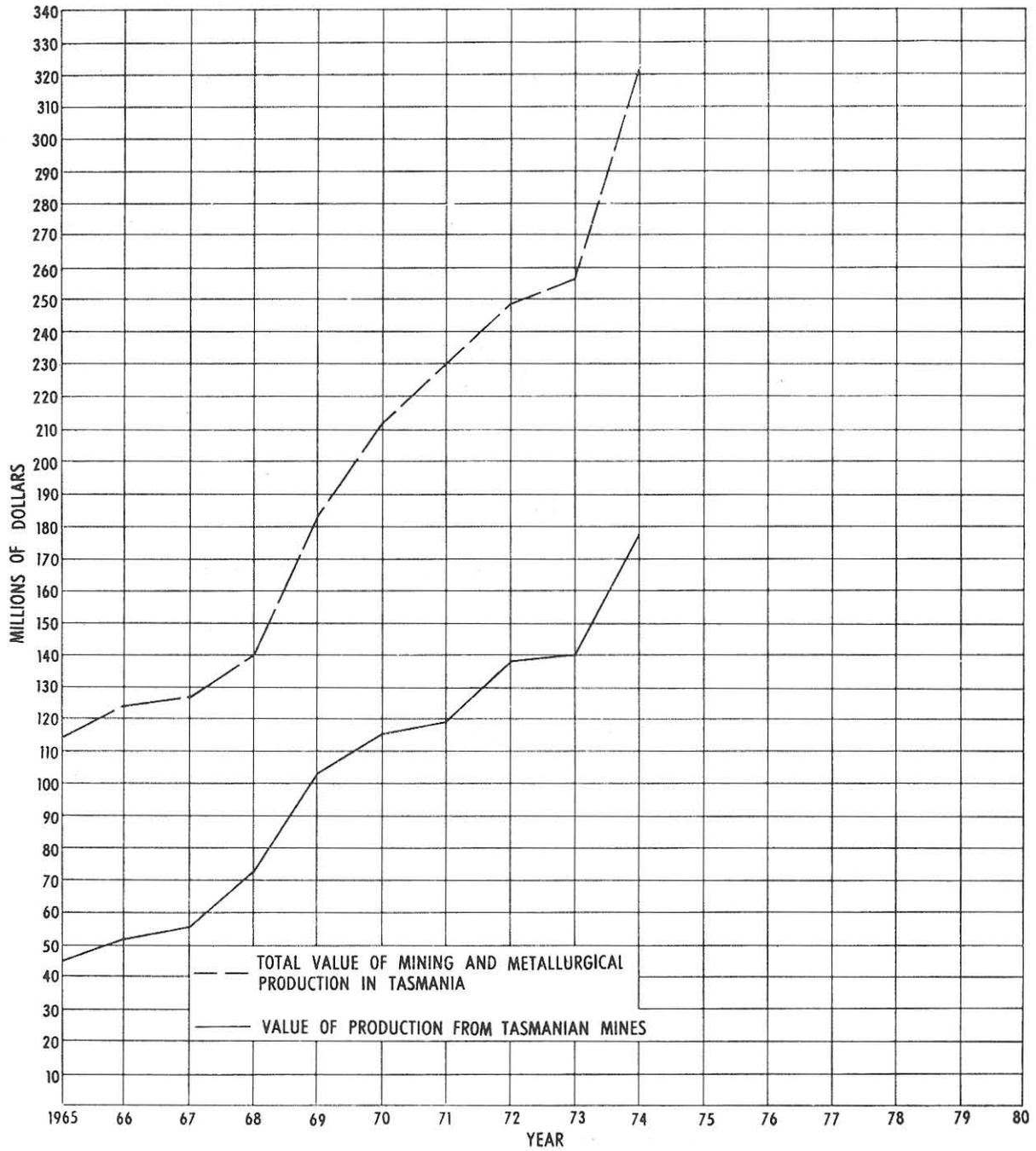
236/74 Kevin James Donohue

237/74 John Henry Sear

238/74 Peter James Diamantes

VALUE OF TASMANIAN MINERALS IN RECENT YEARS WITH AUSTRALIAN METAL PRICES

Year	\$	Year	\$
1965	43 755 904	1970	115 469 042
1966	51 180 693	1971	119 998 652
1967	55 252 710	1972	136 847 182
1968	71 919 344	1973	139 557 052
1969	104 150 500	1974	177 327 923



VALUE OF MINING AND METALLURGICAL PRODUCTION, 1965-1974.

5 cm

MINERAL PRODUCTION SINCE 1880

QUANTITY AND VALUE OF MINERAL PRODUCTION AS AT 31 DECEMBER 1974

<i>Mineral</i>	<i>Unit</i>	<i>Total Quantity</i>	<i>Value \$</i>
METALLIC MINERALS			
Antimony	(tonne)	3	2 034
Bismuth	(kilogram)	110 080	503 385
Cadmium	(tonne)	2 371	8 495 046
Cobalt oxide	(tonne)	62.7	225 403
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	1 155 746
Copper (from 1919)	(tonne)	653 984	375 760 039
Crocoite	(specimens only)	....	17 247
Gold	(kilogram)	94 450	51 257 919
Ilmenite	(tonne)	558	2 512
Iron ore pellets	(tonne)	13 839 451	166 141 562
Iron oxide (including hematite, limonite and magnetite)	(tonne)	201 809	778 723
Lead (from 1919)	(tonne)	488 995	77 240 559
Manganese	(tonne)	1	6
Manganese dioxide (from 1957)	(tonne)	10 010	372 741
Mercury	(kilogram)	7 362	88 581
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)	690 644	....
Rutile	(tonne)	1	36
Rutile (concentrates)	(tonne)	27 068	4 564 741
Scheelite	(tonne)	34 725	80 751 459
Silica for silicon alloy production	(tonne)	72 083	672 304
Silicon as silicon alloys	(tonne)	152 878	17 117 404
Silver-lead ore to 1918 (now shown under Silver and Lead)	(tonne)	1 101 295	12 858 582
Silver (from 1919)	(kilogram)	1 905 419	53 630 528
Sulphur as sulphuric acid (from 1957)	(mono tonne)	2 389 635	34 538 623
Tin	(tonne)	192 691	225 659 759
Wolfram	(tonne)	20 818	35 949 065
Zinc	(tonne)	1 226 174	271 353 572
Zinc sulphate (from 1957)	(tonne)	3 251	324 177
Zircon (concentrates)	(tonne)	22 966	2 108 785
NON-METALLIC MINERALS			
Asbestos	(tonne)	4 044	34 284
Baryte	(tonne)	2 240	16 478
Clay (from 1958)—			
Brick	(metre ³)	1 299 911	3 364 588
Tile	(metre ³)	52 118	111 310
Other	(metre ³)	440 746	1 654 006
Dolomite	(tonne)	58 392	347 194
Graphite	(tonne)	41	214
Kaolin	(tonne)	112 869	883 018

<i>Mineral</i>	<i>Unit</i>	<i>Total Quantity</i>	<i>Value \$</i>
Limestone—			
Agricultural and other	(tonne)	1 016 833	2 482 826
Carbide	(tonne)	919 932	3 525 805
Cement	(tonne)	8 307 113	13 150 028
Chemical and metallurgical	(tonne)	4 618 312	6 615 330
Ochre	(tonne)	2 949	23 483
Pebbles (from 1957)	(tonne)	17 617	298 956
Sand (moulding)	(tonne)	864	9 550
Silica	(tonne)	345 408	830 920
Talc	(tonne)	338	2 154
FUEL MINERALS			
Coal	(tonne)	10 473 142	28 522 538
Shale	(tonne)	42 239	62 462
Peat	(tonne)	1 462	91 548
CONSTRUCTION MATERIALS			
Building stone—			
Freestone	(metre ³)	11 136	395 376
Granite	(metre ³)	4 642	90 858
Other	(metre ³)	12 716	57 455
Crushed and broken stone (from 1958)—			
Basalt	(metre ³)	2 408 785	8 982 394
Dolerite	(metre ³)	8 030 039	32 702 115
Limestone	(metre ³)	320 199	1 178 377
Sandstone	(metre ³)	36 275	88 620
Other	(metre ³)	2 542 447	9 117 669
Gravel (from 1958)	(metre ³)	16 708 311	25 955 659
Sand (from 1958)	(metre ³)	1 791 357	3 680 946
Other road materials	(metre ³)	2 748 038	4 430 048
			\$1 609 862 251

STATISTICS RELATING TO THE MINERAL INDUSTRY

<i>Mineral</i>	<i>Year Ended 31 December 1973</i>		<i>Year Ended 31 December 1974</i>	
	<i>Total Quantity</i>	<i>Value \$A</i>	<i>Total Quantity</i>	<i>Value \$A</i>
METALLIC MINERALS				
Bismuth (kilogram)	5 080	71 373	....	....
Cadmium (tonne)	178	1 026 000	126	760 230
Cobalt oxide (tonne)	10·28	42 190	20·7	104 159
Copper (tonne)	25 329	32 176 630	28 441	35 837 416
Crocoite (specimens only)	....	750	....	3 595
Gold (kilogram)	1 319	2 987 891	1 385	5 118 359
Iron ore pellets (tonne)	2 413 781	27 656 607	2 230 197	26 475 112
Iron oxide (tonne)	12 293	82 394	11 005	73 192
Lead (tonne)	14 362	4 091 160	12 637	5 048 404
Manganese dioxide (tonne)	2 400	97 047	1 308	63 744
Mercury (kilogram)	544	3 265	71	922
Rutile (concentrates) (tonne)	2 965	388 288	4 322	1 062 973
Silica for silicon alloy production (tonne)	11 021	110 210	3 450	34 500
Silicon as silicon alloys (tonne)	24 854	2 749 818	21 573	2 828 217
Silver (kilogram)	60 080	3 553 563	62 093	7 169 721
Sulphur—				
Pyrites (tonne)	244 798	....	224 251	....
Sulphuric acid from pyrites (mono tonne)	331 090	5 183 827	301 872	5 452 341
Sulphuric acid from zinc concentrates (mono tonne)	61 895	827 631	79 200	1 300 706
Tin (tonne)	5 674	20 221 559	5 951	34 221 518
Tungsten as tungstic oxide (tonne)	1 502	4 491 751	1 302	7 876 323
Zinc (tonne)	52 149	22 451 078	53 803	30 973 172
Zircon (concentrates) (tonne)	1 238	72 790	5 531	1 145 030
<i>Value of Metallic Minerals</i> .. .. .	....	128 285 822	....	165 549 634

<i>Mineral</i>	<i>Year Ended 31 December 1973</i>		<i>Year Ended 31 December 1974</i>		
	<i>Total Quantity</i>	<i>Value \$A</i>	<i>Total Quantity</i>	<i>Value \$A</i>	
NON-METALLIC MINERALS					
Clay—					
Brick	(metre ³)	68 760	200 103	70 443	225 840
Tile	(metre ³)	2 883	7 553	7 404	20 440
Other	(metre ³)	42 253	186 159	33 640	141 789
Dolomite	(tonne)	5 165	29 640	6 434	47 444
Limestone—					
Agricultural	(tonne)	33 789	123 154	68 217	194 115
Carbide	(tonne)	23 383	217 649	22 487	270 331
Cement	(tonne)	488 873	948 180	421 145	817 020
Chemical and metallurgical	(tonne)	65 599	343 547	64 333	392 620
Other	(tonne)	22 280	56 558	23 529	50 809
Ochre	(tonne)	62	1 010	38	621
Pebbles	(tonne)	824	18 088	1 426	35 519
Silica	(tonne)	17 101	52 679	25 410	74 828
<i>Value of Non-Metallic Minerals</i> .....		....	2 184 320	....	2 271 376
FUEL MINERALS					
Coal	(tonne)	114 588	530 875	127 460	678 665
Peat	(tonne)	184	10 512	318	27 000
<i>Value of Fuel Minerals</i> .....		....	541 387	....	705 665
CONSTRUCTION MATERIALS					
Building stone—					
Freestone	(metre ³)	1 033	97 018	911	111 644
Granite (red)	(metre ³)	22	4 025	4	1 080
Other	(metre ³)	3 552	23 310	705	1 900
Crushed and broken stone—					
Basalt	(metre ³)	252 235	1 269 485	303 048	1 581 288
Dolerite	(metre ³)	516 708	2 588 449	462 179	2 354 858
Limestone	(metre ³)	22 145	110 725	16 121	81 105
Sandstone	(metre ³)	1 507	7 535	15	324
Other	(metre ³)	188 319	939 858	113 930	610 831
Gravel	(metre ³)	1 306 839	2 770 342	1 518 673	3 209 562
Sand	(metre ³)	137 713	357 952	163 442	602 944
Other road material	(metre ³)	164 390	376 824	80 947	245 712
<i>Value of Construction Materials</i> .....		....	8 545 523	....	8 801 248
<i>Total Value with Australian Metal Prices</i>		....	139 557 052	....	177 327 923
METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES					
Alumina .....	}	....	114 645 092	....	145 802 921
Aluminium					
Aluminium hydrates					
Aluminium sulphates					
Cadmium					
Cobalt oxide					
Ferro-manganese					
Titanium dioxide					
Zinc .....	....	254 202 144	....	323 130 844	
<i>Value of Mining and Metallurgical Production</i>		....	254 202 144	....	323 130 844
Average number of Employees		10 073		10 103	

AID TO MINING

Three loans involving an expenditure of \$26 963 were granted during the year, one for diamond drilling on a lode tin formation in the vicinity of Weldborough and two for the purchase of plant for use in alluvial tin mining operations in the vicinity of Gladstone and at Middleton Creek near Coles Bay. The last two loans are secured by the prescribed form of mortgage deed under the Aid to Mining Act 1927, and the loan for drilling is subject to the prescribed deed of covenant under which the loan is repayable from the proceeds of productive mining or from the sale of the mining lease upon which the drilling was located.

An amount of \$16 143·50 was received as repayments of loans previously advanced for assistance to mining.

Mt Bischoff Tin Mine. The old mine is still under investigation by Comstaff Pty Ltd but there have been no developments. Little interest is being displayed by tribute parties but four tributes continued to be held.

Mining Plant. There was no demand for the use of the items of mining plant purchased some years ago for hire to small parties to test mineral prospects from shafts or other underground mining.

STATEMENT OF RECEIPTS AND PAYMENTS OF THE MINING TRUST FUND FOR THE YEAR ENDED
31 DECEMBER 1974

<i>Receipts</i>	\$	<i>Payments</i>	\$
Balance from last Account	22 671·22	Assistance to individuals and companies	26 962·50
Repayment of loans	16 143·50	Other payments	1·50
Interest on loans	1 360·57	Balance to next Account	13 414·17
Other receipts	202·88		
	\$40 378·17		\$40 378·17

STAFF

The following staff changes occurred during the year:—

<i>Name</i>	<i>Position</i>	<i>Remarks</i>	
Austin, R. L. (Miss)	Typist	Transferred	21.8.74
Barker, M. A. (Miss)	Typist	Appointed	18.6.74
Bates, J. A.	Assistant Publications Officer	Appointed	7.11.74
Bellenger, L. V. (Miss)	Typist	Resigned	13.2.74
Briggs, W. E. (Miss)	Clerk	Appointed	11.7.74
Byers, G. M. (Miss)	Typist	Resigned	12.6.74
Byrne, R.	Clerk	Appointed	29.8.74
Chandler, G. W.	Clerk	Resigned	3.7.74
Cusick, C. (Miss)	Records Clerk	Appointed	8.8.74
Davies, G. L. (Miss)	Student Librarian	Appointed	21.2.74
		Transferred	26.6.74
Deayton, K. M.	Clerk	Transferred	11.7.74
Donnelly, P. J.	Draughtsman	Resigned	5.11.74
Hawkey, R. M. (Mrs)	Office Assistant	Appointed	29.7.74
Hinson, H.	Technician	Appointed	11.3.74
Howard, C. R. (Mrs)	Records Clerk	Resigned	28.6.74
Lane, D. J.	Field Assistant	Resigned	2.1.74
Lockett, C. M. (Miss)	Typist	Appointed	18.2.74
Mackey, N. A. (Miss)	Records Clerk	Appointed	10.1.74
Marriott, W. (Mrs)	Librarian	Resigned	7.2.74
Matthews, D. J.	Field Assistant	Appointed	29.11.74
Meech, C. A.	Draughtsman	Appointed	22.4.74
Mills, B.	Assistant Publications Officer	Resigned	14.8.74
Norton, M. P. (Miss)	Typist	Resigned	19.4.74
Pearn, H. (Miss)	Typist	Transferred	20.2.74
Slater, C. M. (Mrs)	Typist	Appointed	27.5.74
Warren, R. A.	Field Assistant	Appointed	18.11.74

SCHOLARSHIP

D. J. Sloane was awarded a scholarship to enable him to complete his studies for an Honours Degree.

OVERSEAS VISIT

During the year the Director of Mines attended the Tenth Commonwealth Mining and Metallurgical Congress held in Ottawa, Canada as the official Tasmanian delegate.

He visited mining operations in both eastern and western Canada and had discussions on mining and administrative matters with Government departments involved in the mining industry.

CONCLUSION

Appreciation is recorded of the services rendered by officers of the Department, including officers of the Mines Draughting Section, Wardens of Mines and Registrar of Mines in the several mining districts.

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.

J. G. SYMONS, Director of Mines

OPERATIONS AND PRODUCTION

1. — Metallic Minerals

CADMIUM

Year	QUANTITY AND VALUE OF PRODUCTION				
	Tonnes		\$		
1924-1969	1 816	5 502 553	1972	138	658 560
1970	38	275 140	1973	178	1 026 000
1971	75	272 563	1974	126	760 230
			Total	2 371	8 495 046

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

COBALT OXIDE

The source of the 20.70 tonnes of cobalt oxide of value \$104 149 was the same as that of cadmium.

COPPER

SOURCE, QUANTITY AND VALUE OF PRODUCTION

Year	From tin ores		From lead-zinc ores		In blister copper		From copper ores		Total	
	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$
1919-1969	1 094	1 209 646	18 542	13 188 171	501 143	208 564 870	3 046	3 567 840	523 825	226 530 527
1970	775	1 011 242	1 276	1 680 941	.....	.....	21 334	27 493 602	23 385	30 185 785
1971	925	917 843	1 669	1 629 093	.....	.....	22 604	22 256 517	25 198	24 803 453
1972	1 038	981 414	2 478	2 341 658	.....	.....	24 290	22 903 156	27 806	26 226 228
1973	750	941 501	1 746	2 256 020	.....	.....	22 833	28 979 109	25 329	32 176 630
1974	533	678 871	2 555	3 263 125	.....	.....	25 353	31 895 420	28 441	35 837 416
Total	5 115	5 740 517	28 266	24 359 008	501 143	208 564 870	119 460	137 095 644	653 984	375 760 039

The Mount Lyell Mining and Railway Company Limited, Queenstown

Mining—	Tonnes
Overburden removed from Crown Three mine	601 530
Ore mined—	
Prince Lyell	1 232 084
West Lyell	115 937
Crown Lyell	96 319
Cape Horn	453 286
Lyell Tharsis	95 297
Royal Tharsis	401
Crown Three open cut	338 444
	2 331 768
Copper concentrate produced	100 187
Containing—	
Copper (tonnes)	25 353
Silver (grams)	5 217 376
Gold (grams)	492 764
Pyrite concentrate produced	112 762
Total value of production	\$36 579 532

The average number of persons employed was 555 underground and 825 on the surface.

It is considered that the difficult ground conditions below 15 level are attributable to the change in character and frequency of the jointing and shearing patterns, in association with increased pressure at greater depths. Prior to this work no development had taken place so far from the orebodies in the hanging wall.

Development of the second block of open stoping from the decline is on schedule, with the decline face some 20 m beyond the 92 m level, the future extraction level. The drilling of cross-cuts on the 120 and 150 m levels is half completed.

Production remained a three-shift operation with the improved availability of the larger loading units, introduced in 1973, permitting greater efficiency in the rail haulage section. Availability figures for this mine are: Wagner ST 8—65%, Eimco 915—73%.

Considerable work was carried out in an attempt to improve the ventilation particularly on the extraction level (195 m). Little success has attended this effort due to the difficulty of preventing the overdrawing of draw points, thus permitting the vagaries of natural ventilation to interfere with the designed mechanical system.

Two contracts were undertaken by a joint venture group (Roberts, Union Corporation, Holland) to drive a conveyor tunnel and a new main decline. The conveyor tunnel (3.92 m diameter) was driven from the tunnel yard area to the cross-cut from the Cape Horn haulage drive near the 11 level plat of the Prince Lyell shaft at a grade of 1 in 95 rising for a distance of 1 150 metres. The contractors used a Robbins 133/146 mole following an initial 29 metres of conventional mining. Optimum advances were achieved of 15.5 metres per shift; and 200 metres per fortnight. A total of seventy-two cutters was used during this driving, the mole being equipped with twenty-nine disc cutters and one central tri-disc.

In the schist, where jointing was strongly developed, trouble was experienced with large face slabbing blocking the conveyors. The cuttings were moved by conveyors to Hagglund HRST 115B rail shuttle cars, and hauled to the portal by locomotive. With water sprays on the cutting head and the exhaust ducting in good condition ventilation was satisfactory. However, following the face slabbing and the damaging of the flexiduct, rigid ducting was required. Although the mole was essentially a soft rock machine a 100 m band of andesite with a compressive strength 206 MPa, was negotiated at a rate equivalent to a quarter of the normal advance.

The main decline (5.5 m x 4.1 m), the permanent vehicular access to the lower levels, commences at the tunnel yard and is being driven to the 13 level at a grade of 1 in 9. Initially a Dosco Road Header Mark II was utilised for an advance of 50 metres but was withdrawn as the rock became too abrasive resulting in a high pick consumption. An Atlas Copco three-boom jumbo was introduced and the decline mined conventionally. Wast was transported to the surface by an Eimco 920 C.

Cape Horn Mine

Only minor development was undertaken in the main decline. Two rises, bored by the raise borer to provide a separate ventilation system collapsed during reaming through the oxidised zone. An Alimak climber was installed in one rise and using close timber support the rise was completed at the end of the year. The underground workshop and re-fuelling station was completed, and the pillar recovery drive under the open stoping block was commenced.

Production exceeded the budget figure but the grade was well below the target, due to a low grade intrusion in stopes 2 and 3 and to a severe collapse of the hanging wall in stope 5.

Crown Mine

No new development was carried out and production was severely restricted by the continued operation of the open-cut above the mine. The mining of the high grade 12W upper stope was completed but ore remains to be loaded. Difficulty has been experienced in maintaining the scam drifts and draw points, to permit scraping of the stope pillars when blasted.

Crown Three Open-cut

Two large mud and rock slides occurred, but there was no damage to personnel or equipment. The areas involved were being monitored and the movement recorded. Only a small pocket of ore remains to be mined and the stope slot rise from 1 level of the Crown mine broke through to the floor of the cut.

Lyell Tharsis Mine

In order to limit the caving of the walls a vertical pillar was left as a buttress and a new slot was cut.

Royal Tharsis 'A' Lens

A geological re-appraisal of the ore outline resulted in a large reduction in the size of this ore block and limited development was undertaken.

GENERAL

Underground mines provided 80% of the ore treated for the year, the same as in 1973. The major mining problem encountered was ground control. With the mining of the stopes almost complete in each section the removal of the floor and rib pillars may present increased difficulties. Extraction sequences have been planned to permit a retreat system, where practicable, but the stability of some access headings will require careful monitoring. Caving and pillar failure have already occurred in some sections.

ORE RESERVES AT 30 JUNE 1974

Mine	Tonnes	Copper (%)	Silver (g/t)	Gold (g/t)
PROVED ORE—				
Crown Three Open-cut	60 000	1.46	3.980	0.367
Prince Lyell	25 643 000	1.43	1.531	0.245
Lyell Tharsis ..	553 000	1.24	1.531	0.245
Crown Three	1 792 000	1.75	3.980	0.367
Crown Two	36 000	2.50	24.490	0.306
Twelve West ..	35 000	8.75	30.612	0.513
Cape Horn	1 854 000	1.68	4.286	1.224
Total ..	29 973 000	1.47	1.914	0.313
PROBABLE ORE—				
'A' Lens ..	4 524 000	1.32	1.531	0.245
Royal Tharsis ..	2 338 000	1.48	1.531	0.245
Prince Lyell	2 223 000	1.38	1.531	0.245
Cape Horn	1 519 000	1.58	3.061	0.306
Total ..	10 604 000	1.40	1.750	0.254
POSSIBLE ORE (not reserves)—				
Cape Horn	1 939 000	1.28	3.061	0.306
Total ..	1 939 000	1.28	3.061	0.306

MILLING

Crushing

No modifications or additions were made during the year, but provision has been made for a new grinding complex, with commencement of on-site construction and the ordering of two new ball mills.

Concentrate

	Tonnes	Copper (%)	Sulphur (%)
Copper ..	100 187	25.31	....
Pyrite ..	112 762	0.38	48.25

Three fatal accidents occurred in 1974. An explosion in an Alimak rise during the charging of the face killed two miners. The rise was being advanced from the 195 m level of the Prince Lyell mine to the floor of the open-cut, and the face was about 55 metres above the level at the time of the accident. Investigations are continuing into the actual cause of this explosion.

The third fatal accident occurred on 11 level of the Crown mine. An inexperienced underground worker was crushed between a runaway full Granby truck and the leading empty Granby of a locomotive rake being shunted across a set of points.

Cleveland Tin N.L., Luina

This company, reviewed under Tin, produced 2 650 tonnes of copper concentrates containing 534 tonnes of copper valued at \$678 871.

Electrolytic Zinc Company of Australasia Limited, Rosebery

This company, reviewed under Zinc, produced 22 257 tonnes of copper concentrates containing 2 555 tonnes of copper valued at \$3 263 125.

GOLD

QUANTITY AND VALUE OF PRODUCTION

Year	Kilograms	Value	Year	Kilograms	Value
		\$			\$
Prior to 1970	87 080	37 077 763	1972	1 781	2 873 567
1970	1 225	1 266 882	1973	1 319	2 987 891
1971	1 660	1 933 457	1974	1 385	5 118 359
Total				94 450	51 257 919

The Mount Lyell Mining and Railway Company Limited, Queenstown

This company recovered 493 kilograms, valued at \$1 829 940 from sludge in the electrolytic copper refinery.

Electrolytic Zinc Company of Australasia Limited, Rosebery

Concentrates produced by this company contained 891 kilograms, valued at \$3 283 191.

BMI Mining Pty Ltd, South Mount Cameron

Concentrates produced by this company contained 1 kilogram of gold valued at \$4 585.

LISLE GOLDFIELD

Two small workers, Messrs H. A. Graham and W. T. Imlach recovered 171 grams of gold valued at \$643.

IRON ORE (PELLETS)

Savage River Mines, Savage River and Port Latta

	Tonnes
Savage River—	
Overburden removed	7 126 380
Ore mined	4 850 467
Concentrate to Port Latta (dry)	2 182 329
Port Latta—	
Pellets produced (dry)	2 230 197
Value of production	\$26 475 112
Average number of persons employed—	
Mining	146
Other	510
Total	656

P. Allan, Mining Engineer, Burnie, reports:—

Thirty-six shipments of pellets averaging 64 938 tonnes per vessel were despatched from Port Latta during the year despite interruptions to production while three of the five furnaces were rebricked.

At Savage River production has remained steady with a slight increase in ore and waste removal due mainly to the introduction of five 85-tonne GM Terex haul trucks. Some 1 200 metres of diamond drilling were completed to assist in bank stability investigations which are resulting in a better understanding of the geomechanical problems.

The northern access road was completed and a start made to a northern dump which has considerably reduced the waste haul distance from that end of the pit.

In addition to the leasing of the ore carriers, five utility trucks in the fleet were replaced while the major capital expenditure for the year was confined to improvements in the town site, drainage, curbing and footpaths, the covering of the swimming pool and the bitumen surfacing of the remainder of the access road from the township to the mine site.

Sixty-seven reportable accidents occurred during the year, fourteen of these being at Port Latta, an increase of 133%, and fifty-three at Savage River, an increase of 26%. A quarter of the accidents involved back strain.

Accident statistics for the year were:—

	Accidents	Days Lost		Man Hours	Frequency Rate	Severity Rate	Mean Duration (Days)
		Working	Calendar				
Savage River	53	513	685	816 642	64.9	1 282	9.7
Port Latta	14	169	230	510 993	27.4	450	11.4
Combined	67	682	815	1 327 635	50.5	614	10.2

IRON OXIDE

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
Prior to 1970	148 395	434 988	1972	9 783	61 956
1970	9 609	60 667	1973	12 293	82 394
1971	10 724	65 526	1974	11 005	73 192
			Total	201 809	778 723

Iron Cliffs Mine, Penguin

A. Pearson continued to work the secondary ore at the Iron Cliffs mine and supplied a cement works with 11 005 tonnes of hematite valued at \$73 192. Employment averaged six men.

LEAD

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1919 to 1969	418 514	57 242 452	1972	20 303	4 951 450
1970	10 727	2 981 018	1973	14 362	4 091 160
1971	12 452	2 926 075	1974	12 637	5 048 404
			Total	488 995	77 240 559

Electrolytic Zinc Company of Australasia Limited, Rosebery

This company, reviewed under Zinc, produced 12 402 tonnes of lead concentrate and the total content of lead in the lead, zinc and copper concentrates was 12 635 tonnes valued at \$5 047 500.

Spray Mine, Zeehan

Mr C. I. Clark produced 5.43 tonnes of concentrates containing 2.38 tonnes of lead valued at \$904.

Adelaide Mine, Dundas

An unusual method of extracting specimens of crocoite was tried during the early part of the year. The miners used a bulldozer to open-cut one of the lodes directly above the sub-level stope (0.6 m wide) previously worked. Little success attended this operation. On 6 September 1974 the lease was declared forfeit on the application of Mr F. Mihajlowits who commenced underground work. Production of crocoite was valued at \$3 000.

Red Lead Leases, Dundas

Two men occupied separate areas of these leases towards the end of the year and commenced underground exploration from old adits to locate mineral specimens.

CROCOITE

The value of small workers' production was as follows:—

	\$
F. Mihajlowits from the Anderson prospect	500
H. R. Willins from the West Comet mine	95

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 in its West Coast mines. The production of 1 308 tonnes was valued at \$63 744.

MERCURY**QUANTITY AND VALUE OF PRODUCTION**

Year	Value		Year	Value	
	Kilograms	\$		Kilograms	\$
1967 to 1969	4 526	62 758	1972	593	2 986
1970	1 290	16 166	1973	544	3 265
1971	302	2 484	1974	71	922
			Total	7 326	88 581

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. Production for the year was 71 kilograms, valued at \$922.

OSMIRIDIUM

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

PYRITE**QUANTITY PRODUCED**

Year	Tonnes	Year	Tonnes
1915 to 1969	1 865 112	1972	221 595
1970	76 547	1973	244 798
1971	182 411	1974	224 251
		Total	2 590 463

Since 1969 pyrite concentrates produced by the Mount Lyell Mining and Railway Company Limited, Queenstown and the Electrolytic Zinc Company of Australasia have been sent to the North-West Acid Pty Ltd treatment plant at Wivenhoe.

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

SILICA FOR SILICON ALLOY PRODUCTION

The Broken Hill Proprietary Company Limited, Beaconsfield

This company mined and supplied to the Tasmanian Electro-Metallurgical Company 3 450 tonnes of silica valued at \$34 500. A local contracting firm carried out the work.

SILICON

Tasmanian Electro-Metallurgical Company Proprietary Limited, Bell Bay

In the production of silicon as silico-manganese this company smelted 10 800 tonnes of local Beaconsfield quartzite combined with slag from ferro-manganese production for a yield of 21 573 tonnes of silico-manganese valued at \$2 828 217. The average number of persons employed is shown under Ferro-Manganese.

Kemerton Pty Ltd, Electrona

This company adapted the No. 2 furnace of the Australian Commonwealth Carbide Co. Ltd for a test run on ferro-silicon production. The materials used were silica from the Glovers Bluff mine of Consolidated Goldfields Australia Limited, Savage River pellets, char and woodchips. Production was 185 tonnes.

SILVER

Silver is nowhere mined for itself but is a valuable by-product from copper, lead and zinc ores.

PRODUCERS, SOURCE, QUANTITY AND VALUE OF PRODUCTION, 1974

<i>Producer</i>	<i>Source</i>	<i>Kilograms</i>	<i>\$</i>
C. I. Clark	Silver-lead	9	1 045
Cleveland Tin N.L.	Tin and copper concentrates	445	51 273
EZ Co. of A/asia Ltd	Copper, lead and zinc concentrates	56 422	6 515 222
Mt Lyell M. & R. Co. Ltd	Refinery sludge	5 217	602 181

SOURCE, QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>From tin and other ores</i>		<i>From silver-lead ore</i>		<i>From copper ore</i>		<i>From lead-zinc ore</i>		<i>Total</i>	
	<i>Kilograms</i>	<i>\$</i>	<i>Kilograms</i>	<i>\$</i>	<i>Kilograms</i>	<i>\$</i>	<i>Kilograms</i>	<i>\$</i>	<i>Kilograms</i>	<i>\$</i>
1919-1969 ..	3 788	101 764	550 239	5 749 634	125 852	1 975 745	928 123	27 003 931	1 608 002	34 831 074
1970 .. ....	....	....	....	....	3 521	177 458	40 574	2 060 012	44 095	2 237 470
1971 .. ....	....	....	....	....	3 673	156 351	48 254	2 016 052	51 927	2 172 403
1972	2 572	123 722	....	....	4 174	191 595	72 476	3 350 980	79 222	3 666 297
1973	663	38 686	....	....	3 944	231 726	55 473	3 283 151	60 080	3 553 563
1974	445	51 273	9	1 045	5 217	602 181	56 422	6 515 222	62 093	7 169 721
Totals	7 468	315 445	550 248	5 750 679	146 381	3 335 056	1 201 322	44 229 348	1 905 419	53 630 528

SULPHUR

Sulphuric acid is produced in the roasting at Risdon of the zinc concentrates from the West Coast mines of the Electrolytic Zinc Company of Australasia Limited, and from the treatment by North-West Acid Pty Ltd of pyrite concentrates produced by the Electrolytic Zinc Company and by the Mount Lyell Mining and Railway Company Limited.

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

Year	From zinc concentrates		From pyrite concentrates			Total	
			Pyrite	Acid			
	Mono tonnes	\$	Tonnes	Mono tonnes	\$	Mono tonnes	\$
1957-1969	608 405	7 158 606	.....	.....	.....	608 405	7 158 606
1970	59 389	889 263	76 547	88 778	1 415 482	148 167	2 304 745
1971	51 642	628 629	182 410	353 627	5 205 420	405 269	5 834 049
1972	96 209	1 217 939	244 281	357 528	5 258 779	453 737	6,476 718
1973	61 895	827 631	242 618	331 090	5 183 827	392 985	6 011 458
1974	79 200	1 300 706	232 763	301 872	5 452 341	381 072	6 753 047
Totals	956 740	12 022 774	978 619	1 432 895	22 515 849	2 389 635	34 538 623

North-West Acid Proprietary Limited, Wivenhoe

This company continued to treat pyrite concentrates produced by the Electrolytic Zinc Company, Rosebery and the Mount Lyell Mining and Railway Company, Queenstown. Production for the year was 301 872 mono tonnes of acid.

The operation of the plant at design capacity was achieved over short periods. Difficulties were experienced with shipping schedules due to external industrial action resulting in shut-downs when acid storage capacity was reached. Higher plant availability, with the consequently reduced number of noisy firings, coupled with a small reduction in the plant noise output, resulted in fewer complaints from the local residents. Demand for acid during 1974 remained high but market indications for 1975 do not appear bright. It is hoped that some sales of calcine will be made in 1975.

Safety

The number of employees during the year averaged 118 and the labour turnover remained at a low figure. Ten lost-time accidents occurred during the year, none of which was classified as serious.

Work injury statistics were:—

Man hour exposure	272 577
Frequency rate	36.6
Severity rate	293
Mean duration (days)	5.7

TIN

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1873 to 1969	163 055	111 994 597	1972	6 825	22 439 882
1970	5 018	16 927 602	1973	5 674	20 221 559
1971	6 168	19 854 601	1974	5 951	34 221 518
			Total	192 691	225 659 759

Aberfoyle Ltd, Rossarden

PRODUCTION

	Ore Milled (Tonnes)	Cassiterite concentrates (Tonnes)	Tin in concentrates (Tonnes)	Value (\$)	Wolfram concentrates (Tonnes)	WO ₃ in concentrates (Tonnes)	Value (\$)	Hydraulic fill (Tonnes)
Aberfoyle	28 795	228	168	974 783	103	75	481 824	17 390
Storeys Creek	15 367	57	42	248 633	113	84	594 026	5 860
Aberfoyle Mill	44 162	285	210	1 223 416	216	159	1 075 850	23 250

EMPLOYMENT AND DEVELOPMENT

Mine	Average Number of Men		Driving and cross-cutting (Metres)	Rising (Metres)
	Underground	Surface		
Aberfoyle	53	56	13.4	27
Storeys Creek	42	3	46	...

R. C. Thomas, Mining Engineer, Hobart, reports:—

Aberfoyle Mine

The labour force at the mine remained static throughout the year. The decline in the price for tin was offset by the rise in price for wolfram and as a result stoping operations were being directed to the richer wolfram areas. Production was affected in August and September when the mine pumping facilities could not cope with the inflow of water due to abnormally heavy rains. The pumping station at 14 level was flooded and hoisting operations were curtailed.

Two new cages were installed in the shaft. The Marcy rod mill was completely overhauled and relined, the rolls crusher was replaced with a 560 mm Symons cone crusher.

The following expenditure was incurred on capital works:—

	\$
Mill modifications	14 104
Cages	6 730
Storage shed	2 100
	<hr/> 22 934 <hr/>

Ore reserves at 30 November 1974 were as follows:—

	Tonnes
Indicated ore	177 000
Inferred ore	57 400
	<hr/> 232 400 <hr/>

The marked decline in ore reserves reflects, in the main, re-appraisal of the ore at present cost and price levels.

Storeys Creek Mine

At the beginning of the year there was a limited operation above 3 level in areas which had significant amounts of tin. However as wolfram prices rose operations were increased until at the end of the year the labour force had grown to fifty men.

The rod mill in the mill was overhauled and relined ready for operation early in 1975 to supply sand for filling underground. A road was put in along Eastern Hill to the creek at the old mill site. Old tailings are to be recovered from the creek and put through the rod mill circuit to recover a tin/wolfram concentrate for further treatment at Aberfoyle, the tailings sand being used for fill. The chemical treatment of mine drainage water continued at a cost of \$10 100 for the year.

Ore reserves at 30 November 1974 were as follows:—

	Tonnes
Indicated ore	155 000
Inferred ore	26 650
	<hr/> 181 650 <hr/>

The decline in ore reserves from the previous year reflects a re-appraisal of ore left in remnants which are inaccessible at the present cost and price levels.

BMI Mining Pty Ltd, South Mount Cameron

A section of the Ringarooma River above Moorina which had been dried out by a diversion cut was worked by dragline discharging onto a grizzly. The undersize was pumped to a jig plant.

A total of 120 000 cubic metres was treated during the year for a yield of 28·858 tonnes of concentrates containing 20·841 tonnes of tin valued at \$120 360. Employment averaged sixteen men.

Cleveland Tin N.L., Luina

E. C. Leyland, Mining Engineer, Burnie, reports that there has been an increase this year in the tonnage treated: 319 211 tonnes containing 0·75% Sn and 0·25% Cu, were treated. Recoveries were as follows:—

	<i>Tonnes</i>
Tin concentrate	2 582
Tin content	1 595
Copper concentrate	2 670
Copper content	534
Tin content	70

DEVELOPMENT

	<i>Ore (m)</i>	<i>Mullock (m)</i>
Driving and cross-cutting	1 472·2	82·6
Decline advance .. .. .	....	155·8
Rising	134·8	17·5
	<hr/> 1 607·0	<hr/> 255·9

PRODUCTION

Mine production was 315 274 tonnes, of which 48% came from development and silling. The drilling of 67 201 metres of ring holes was achieved resulting in the program being well ahead of current requirements. Haulage units continue to be the brake on mine efficiency and the extremely high cost of a 'break-down maintenance only' policy contributed in no small measure to the high costs escalation of this year. A strike by maintenance workers, which lasted six weeks, resulted in the company ordering four new underground loading and haulage units and completely re-building two of the Wagner MTFs. The equipment ordered comprises two Wigtrucks of 35 tonnes capacity and two Caterpillar 988 front-end loaders.

CAPITAL EXPENDITURE

During the year the following capital items were received or completed:—

- One Caterpillar 988 loader
- Two mine service vehicles
- An inflow conveyor weightometer
- Buildings: ANFO shed and security office.

MILLING

The mill operated for 304 days. During the year blending of the various ores for treatment was discontinued, after poor tin recoveries were experienced. Accordingly, separate stockpiles for coarse ore were established and it was hoped that when treating Khaki Lode changing of the fine screen size would give an improved recovery, though limiting throughout. Results to date have been disappointing and research work is being undertaken to improve the treatment process for the Khaki-B South type ores.

In the gravity concentrator the six manually turned DSM screens were replaced by eight auto-turned units, and a new reagent feeder was commissioned.

EXPLORATION

The surface exploration program on the leases has been completed and field work is now being undertaken on the exploration licence area surrounding the leases. The deep drilling program to indicate reserves and interpret structure was concluded. Reserves were assessed in September 1974 as 2.25 million tonnes of 'indicated ore' containing 0.82% cassiterite tin and 0.34% copper.

These reserves encompass ore in Halls lenses to the 16 level, which is regarded as the economic limit for the current mine system. Khaki-B South lenses remain to be tested below the current workings. From this drilling program the structural geological interpretation of the ore has been confirmed. A prospect south of the mine, but within the existing lease, reached the stage of diamond drill planning. A further prospect north of the mine was tested by geochemical and geophysical means and is being drilled.

SAFETY

The following is the work injury record for the year:—

Man hours exposure	422 801
Frequency rate	141.9
Severity rate	7 830
Mean duration (working days)	14.3

An average of 232 men were employed, of whom fifty-one were underground workers.

Renison Limited, Renison Bell

Ore mined—	<i>Tonnes</i>
Federal	66 581
Lower North Stebbins	77 351
Upper North Stebbins	54 237
Upper Dreadnought	49 766
Colebrook	54 672
Penzance	19 206
Howard	484
Murchison	18 243
Bassett	65 439
	<hr/>
	405 979
	<hr/>
Tin concentrates produced—	
High grade	6 375
Low grade	2 749
	<hr/>
	9 124
	<hr/>
Tin content	3 878
Overall recovery	69.4%

P. Allan, Mining Engineer, Burnie, reports that the Renison decline advanced 305 metres to 3 816 metres from and 412 metres below the portal. In addition, 3 345 metres of driving and cross-cutting and 293 metres of rising were completed.

Ore treated amounted to 407 227 tonnes at 1.37% Sn, an increase of 27% over 1974.

An automatic computer control system has been successfully commissioned in the primary grinding circuit which ensures optimum treatment rate, steady state conditions and improved plant availability. Stainless steel wedge wire screens in the primary grinding circuit have now been replaced by polyurethane sieve panels and these are being further tested at various apertures in other circuits, the initial results to date indicating their superiority in wear resistance. A battery of seven twin-start Reichert fibreglass spirals has been successfully introduced to replace coarse roughing tables and test work is now being conducted into their application on finer streams. A marked improvement in separation has been obtained in the fine roughing section by replacing all slime decks with an intermediate three-quarter riffled sand deck. A 40 mm cyclone was installed to recover fine tin from slime tailings for further treatment in the cassiterite flotation section. XRF probes to monitor continuously tin in three streams in the sulphide flotation section are to be installed. Towards the end of the year, a start was made on a heavy-media separation plant. Separation is effected by two Dynawhirpool cyclone units and it is estimated that ore treatment rate will be raised to 650 000 tonnes per annum when commissioning is complete.

The company drilled 6 805 metres in twenty-eight surface diamond drill holes and 8 214 metres in seventy-one underground holes to delineate known orebodies.

After allowing for depletion by mining, the combined proved and probable reserves increased by 1·275 million tonnes or 16% while the average grade was increased from 1·34% to 1·36% Sn. The major part of this tonnage increase resulted from confirmation of the existence of several possible ore zones in the Central Bassett and Lower Federal areas.

Ore reserves at September 1974 were as follows:—

Orebody	Probable		Proved		Possible	
	(Tonnes)	%	(Tonnes)	%	(Tonnes)	%
Federal	1 740 000	1·03	1 150 000	1·08	1 000 000	1·00
Bassett	1 400 000	1·24	660 000	1·40	6 500 000	1·15
No. 2 Horizon	490 000	1·38	890 000	1·45	100 000	1·20
No. 3 Horizon	500 000	1·65	2 100 000	1·75	.. .. .	.. .. .
Other lodes	150 000	1·26	250 000	1·26	.. .. .	.. .. .
Totals	4 280 000	1·24	5 050 000	1·47	7 600 000	1·13

Capital expenditure for the year was as follows:—

	\$
Housing and amenities	250 000
Mine site buildings	535 000
Mine plant and equipment	486 000
Concentrator	1 581 000
Mine development	572 000
Maintenance equipment and sundries	80 000
Exploration	268 000
	3 772 000

SAFETY

One hundred and fifty accidents occurred during the year but none was fatal. The total number of persons employed was 411.

Accident statistics for the year were:—

Man hours exposure	743 425
Frequency rate	201·8
Severity rate	3 029
Mean duration (days)	10·9

Ringarooma Mining Pty Ltd, Waratah

This company produced 176 tonnes of tin concentrates containing 70 tonnes of tin from 71 000 cubic metres of gravel. An average of seventeen men was employed.

Two serious production delays occurred—five weeks from major plant alterations and five weeks from an inter-union dispute. The feed preparation plant is now sited close to the concentration plant and all material mined is hauled to the primary bin by off-highway haulage units. A heavy static grizzly is installed over this bin to remove all +300 mm rock. An apron feed under this bin feeds onto a conveyor to a washing unit which in turn feeds onto a vibrating two-deck screen. This screen separates the feed into a -37 mm fraction which goes directly to a waste, a -37 mm +20 mm fraction which is fed to the bull-jig unit for recovery of +20 mm nuggets, and the -20 mm fraction which is pumped directly to the concentrator.

A tabling section has been added to the concentrator which improves very effectively the recovery of fine cassiterite and the quality of concentrate by removal of pyrite. Three old tables from the Bischoff Battery were reconditioned and re-decked for this work.

The company has not yet succeeded in impounding their tailings in a satisfactory manner.

The change from the semi-portable grizzly concept made the dragline more mobile, cut down on pipelines, and reduced the use of the bulldozer to feed the dragline. The dragline is now used for development and the removal of overburden, with wash being dug and loaded by a large hydraulic back-hoe.

An attempt was made to establish the western limit of the ore reserves at the junction of Cliff Creek with the north valley. This was aborted by collapse of the holes under very wet conditions. No other exploratory work was undertaken.

Capital expenditure for the year was \$69 667 which included the construction of the re-designed feed preparation plant.

There were two disabling work injuries during the year giving the following accident statistics:—

Man hours exposure	....	....	....	....	....	....	....	44 148
Frequency rate	....	....	....	....	....	....	....	45
Days charged	..	....	....	....	....	....	....	7
Severity rate	..	....	....	....	....	....	....	155
Mean duration (days)	....	....	....	....	....	....	....	4.5

V. Wood, Pioneer Mine, Pioneer

Production from an estimated 195 000 m³ of gravel treated was 20.3 tonnes of tin in concentrates valued at \$117 460. An average of seven men was employed.

K. Kerrison, Ringarooma River Beaches

Mr Kerrison continued operations with a front-end loader and a jig, to produce 3.2 tonnes of tin in concentrates valued at \$18 003 from 7 900 m³ of gravel.

Mount Cameron Tin Syndicate, Gladstone

This syndicate moved from South Mount Cameron to the Garfield area. Production from 38 800 m³ of gravel was 11.1 tonnes of tin in concentrates valued at \$64 935.

T. G. Rainbow, Banca Mine, Winnaleah

Mr Rainbow sluiced 9 600 m³ to recover concentrates containing 3.3 tonnes of tin valued at \$18 711. A new tailing dam was constructed.

Allied Mining Enterprises Pty Ltd, South Mount Cameron

This company continued to mine shallow ground by bulldozing up to a monitor. The sluicing of 29 590 m³ of gravel yielded concentrates containing 8.3 tonnes of tin valued at \$48 109.

NSW Mining Co. Pty Ltd, Derby

This company worked in the Ringarooma River below the Mutual Bridge using a jig and grizzly and a dragline and front-end loader to produce 10.2 tonnes of tin valued at \$58 099; three men were employed.

R. C. Lawry, Gladstone

Mr Lawry continued work in the Garfield area to obtain concentrates containing 3.7 tonnes of tin valued at \$22 676.

C. D. King, Port Davey

Mr King produced concentrates containing 1.97 tonnes of tin, valued at \$11 524, from the Melaleuca mine.

Minops Pty Ltd, Dundas

After a re-assessment of all available information this company announced the following reserves at the Razorback mine:—

	<i>Indicated Tonnes</i>	<i>Grade % Sn</i>	<i>Inferred Tonnes</i>	<i>Grade % Sn</i>
Oxidised ore	250 000	0.7	43 000	0.67
Sulphide ore	117 000	0.8	120 000	1.3

Considerable test work was carried out, in co-operation with the Department of Mines laboratory staff, to assess the most suitable method of treating the oxidised ore. This work highlighted the variance in cassiterite grain size, and also indicated the differing mineral assemblage of the ore type. Selection of the magnetic separation equipment was finalised, the choice being high intensity separators, and the mill flow sheet was confirmed.

Field geology, in association with geophysical methods, gave a better appreciation of the structural control of the orebody and the mineral associations. Several interesting anomalies on the leases were delineated by the use of gradient array induced polarisation. It is planned to diamond drill these areas in 1975.

The contract for the construction of the concentrator was let and production is planned to commence in July 1975. The initial production target is 10 tonnes/hour for a 60 000 tonnes annual throughput. It is estimated that a total labour force of twenty-two men will be needed. The mining method is to be open-cut and initially this work will be carried out by contractors.

The installation of 4 kilometres of power line was completed and power is now available at the concentrator site. The average employment for the year was four staff men. Two houses were constructed in Zeehan and a further building project commenced.

Production by Small Workers

Many miners and prospectors throughout the State produce small quantities of concentrates by reason of either small-scale or part-time working. Their work is described under the headings of the various districts.

EAST COAST

L. D. McRae, Coles Bay, produced concentrates containing 0.269 tonne of tin valued at \$1 574.

T. H. Fitzallen produced concentrates containing 0.173 tonne of tin valued at \$990.

N. Clarke, Coles Bay, produced concentrates containing 0.541 tonne of tin valued at \$2 843.

Miscellaneous. Messrs Haas, H. T. Moses, B. F. Pitchford and J. P. Reynolds produced individually concentrates containing 0·238 tonne of tin valued at \$1 370.

BRANXHOLM-DERBY

L. M. Barnett, Star of Peace Mine, Branxholm. Mr Barnett's concentrates contained 1·165 tonnes of tin valued at \$6 753.

W. L. and W. J. Mullins produced concentrates containing 0·383 tonne of tin valued at \$1 983 from their mine at Ruby Flat.

Miscellaneous. Messrs Burr, R. W. Machen and Youd individually produced concentrates containing 0·151 tonne of tin valued at \$844.

PIONEER-SOUTH MOUNT CAMERON-GLADSTONE

L. J. Groves, Eastern Lead, South Mount Cameron. Mr Groves, using earth-moving equipment, mined gravel for sluicing. Concentrates produced contained 0·195 tonne of tin valued at \$1 076.

D. Dawe, Harden's Ravine, produced concentrates containing 0·706 tonne of tin valued at \$4 035.

H. Fenton, Corduroy Creek, produced concentrates containing 0·592 tonne of tin valued at \$3 248.

K. M. Richardson, Swain Creek, produced concentrates containing 0·631 tonne of tin valued at \$3 650.

Miscellaneous. Messrs K. M. Fitzallen, N. B. Moore, R. Moore, F. A. and K. Richardson and H. Standage produced individually concentrates containing 0·270 tonne of tin valued at \$1 565.

WARATAH AND WEST COAST

P. R. H. Wilson, Melaleuca. Mr Wilson set up a jig plant and commenced working to produce concentrates containing 0·277 tonne of tin valued at \$1 618.

Miscellaneous. Messrs E. J. Bayley, M. Glozier, Housego, Sloggett, Young and Freole produced individually concentrates containing 0·380 tonne of tin valued at \$2 179.

TITANIUM

TITANIUM DIOXIDE: QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value	Year	Tonnes	Value
		\$			\$
1969	5 009	775 086	1972 .. .. .	....	....
1970	7 136	1 216 274	1973	2 846	388 288
1971	6 584	1 122 120	1974	4 139	1 062 973
			Total	25 714	4 564 741

Kibuka Mines Pty Ltd, Naracoopa

Mining

The mining operation was concentrated at the north end of the Llanherne Beach deposit between the Fraser River and the primary wet plant. The buried loader functioned throughout the year and an additional unit was brought into operation to facilitate the mining of the lower section of the orebody. This unit, known as the 'Pot Holer', comprises a pontoon-mounted sand pump. To operate, the dredge head ladder is lowered into a pit, into which the sand feed is bulldozed and sluiced to the dredge head. This unit handles about 175 tonnes of sand per hour. Two bulldozers were acquired during the year for feeding sand to the mining units and for levelling tailings. A new tailings disposal area was constructed on the west side of the mined-out area and at the year end tailings were being pumped thence, leaving the old tailings area ready for reclamation.

Milling

The primary separation plant was rebuilt during the year. The throats of the pinched sluices and feed boxes have been re-designed and the inclination of the sluice altered.

Two banks of spirals have been added to the secondary wet plant. The configuration of the wet magnetic separators has been changed so that all material passes twice over the magnets. An attritioner, using flaked caustic soda as an agent, designed and built on site, is working satisfactorily resulting in improved recovery and product grade. Three more of the seven wet tables have been reconditioned and are now in operation.

A new stainless steel dryer has been installed in the dry plant. The hopper configuration in the electrostatic roughers has been completely re-designed resulting in an increase in throughput and recovery. The rutile circuit has been improved by a 50% increase in the magnetic separator capacity. In the zircon circuit, a new recleaner has been installed together with two plate cleaners made at the mine. These alterations make it possible to produce grade rutile and zircon simultaneously, whereas previously any attempt resulted in off-grade material.

Two of the six Mirrlees engines were rebuilt during the year to give a 100% standby capacity in the power house.

From the treatment of 596 726 tonnes of sand 4 322 tonnes of rutile concentrates and 5 531 tonnes of zircon concentrates were produced. An average of fifty-three men was employed.

Development work is in progress to increase production by 25%. The capacity of the primary wet plant is to be doubled and its efficiency increased by installing sluice trays with variable angle throats and new spirals. In the secondary plant two wet magnetic separators will be added and a tin recovery table installed. Consideration is also being given to the installation of a zircon milling plant.

TUNGSTEN (SCHEELITE)

TUNGSTIC OXIDE: QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes (Concentrates)	Tonnes (WO ₃)	Value \$
1917 to 1969	26 921	....	55 708 672
1970	1 087	773	5 253 996
1971	1 610	1 151	5 130 809
1972	1 837	1 355	4 193 860
1973	1 682	1 244	3 663 649
1974	1 588	1 143	6 800 473
Total	34 725		80 751 459

King Island Scheelite Limited, Grassy

Production statistics—

Overburden removed (tonnes)	127 949
Ore mined (tonnes)—	
Open-cut	150 949
Bold Head	23 115
Dolphin	63 523
Mill throughput (tonnes)	298 933
Concentrate (produced) tonnes)	1 588
Concentrate grade (WO ₃)	71.97%
Average number of persons employed—	
Open-cut	10
Underground	54
Other surface	300
	<hr/>
	364
	<hr/>

MINING

Open-cut

During the year production decreased and finally ceased in October. A sump with pump stations was established at the bottom to pump both surface run off and underground water from the Dolphin Mine.

Bold Head Mine

The decline was advanced 374 metres during the year, with ground conditions improving, especially in the quartzite. Development and stope driving amounted to 582 metres, raising by conventional methods amounted to 39 metres and sinking to 18 metres.

During the year a Kennametal 1.8 m diameter raise borer was obtained and two 110-metre raises were completed. One raise is to be used as a manway and the other has been equipped with a fan. A third raise has been commenced also for ventilation purposes. Both 'A' and 'B' lenses were intersected during the year and stope development commenced in 'B' lens with 23 115 tonnes of development ore being sent to the mill.

Dolphin Mine

The Dolphin decline was advanced 374 metres generally in good ground conditions, although one section required steel sets. Level development and stope driving amounted to 1 078 metres and 36 metres of raising were completed. Stopping commenced in the 'C' lens central area and in the eastern extension of the open pit orebody above the 75-metre level, 63 523 tonnes of ore being sent to the mill from these operations. Twin ventilation raises are to be bored from the surface to the 75-metre level.

MILLING

The mill operated for 354 days during the year with a throughput of 293 933 tonnes at a head of 0.558% WO_3 . The lower than usual throughput was largely due to an eighteen-day strike at the mine.

The grinding circuit was reorganised and a two-stage grind introduced. Improvements include the installation of a Ramsey belt weightometer, a Morgensen sizer on No. 3 ball mill and a 510 mm cyclone as a standby for the bowl rake classifier in the grinding section. In the gravity section the hydrosizers were completely renewed. In the flotation section the Denver cells were reconditioned and the entire switchboard is being renewed. In the concentrate cleaning section and the drying section a second cross-belt magnetic separator and a new electrical switchboard were installed. A new tailings disposal system is almost ready to operate.

CAPITAL EXPENDITURE

The majority of capital expenditure was for equipment and services at the two underground mines, but was also incurred on the new tailings disposal system and the erection of a KLSS6 engine and alternator in the power house.

Capital expenditure was as follows:—

	\$
Underground mines	874 964
Concentrator	123 097
Engineering	56 932
Power house	29 939
	<hr/>
	1 084 932
	<hr/>

TUNGSTEN (WOLFRAM)

TUNGSTIC OXIDE: QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes (Concentrates)	Tonnes (WO ₃)	Value \$
1899-1968	17 733	....	25 187 739
1969	612	444	2 034 886
1970	910	659	4 428 708
1971	813	592	2 695 463
1972	771	566	1 733 203
1973	375	278	828 102
1974	216	159	1 075 850
Total	20 818		35 949 065

Aberfoyle Ltd, Rossarden

Production by this company, reviewed under Tin, was as follows:—

Mine	Concentrates (Tonnes)	WO ₃ content (Tonnes)	Value \$
Aberfoyle	103	75	481 824
Storeys Creek	113	84	594 026

ZINC

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1919-1969	973 239	165 895 099	1972	66 811	24 869 254
1970	38 328	12 335 394	1973	52 149	22 451 078
1971	41 844	14 829 575	1974	53 803	30 973 172
			Total	1 226 174	271 353 572

Electrolytic Zinc Company of Australasia Limited

EXTRACTION FROM CONCENTRATES: RISDON

	Tonnes
From other than Tasmanian ore—	
Zinc	120 673
Cadmium	428
Cobalt oxide	9
Superphosphate	123 856
From Tasmanian ore—	
Zinc	53 456
Cadmium	112
Cobalt oxide	20·70
Manufactured products—	
Aluminium sulphate	3 708
Ammonium sulphate	24 676

The average number of men employed was 2 435.

WEST COAST DIVISION

Ore mined—

Mine	Tonnes	Pb %	Zn %	Cu %	Ag g/t	Au g/t	Fe %	S %
Rosebery	447 463	4.5	14.40	0.85	182	3.28	14.87	(23.30)
Hercules	37 169	5.0	15.50	0.34	121	1.94	7.80	(12.22)
Farrell	845	11.4	4.42	0.22	386	....	9.41	(14.74)
Dumps	6 950	3.8	5.47	0.35	181	1.30	13.30	(20.84)
Total ..	492 427	4.54	14.34	0.80	178	3.15	14.31	22.41

Concentrate produced—

	Tonnes
Zinc concentrate	115 635
Lead concentrate	12 402
Copper concentrate	22 257
Pyrite concentrate	115 869

Recoverable quantity in ore mined—

Zinc	803 tonnes
Lead	12 635 tonnes
Copper	2 555 tonnes
Cadmium	126 tonnes
Silver ..	56 422 kilograms
Gold	890 kilograms
Cobalt oxide	21 tonnes
Manganese dioxide	1 308 tonnes
Mercury	71 kilograms

Total value of production—\$46 820 115.

Average number of persons employed—

	Surface	Underground	Total
Hercules Mine	5	31	36
Rosebery Mine	481	550	1 031
Farrell Mine ..	3	6	9
Total	489	587	1 076

P. Allan, Mining Engineer, Burnie, reports:—

Operations were confined to the Rosebery and Hercules Mines, the latter operating on a single shift basis. Due to a continuing shortage in labour and the low zinc grade the Farrell mine has remained on a care and maintenance basis.

Rosebery Mine

Some 3 214 metres of driving and cross-cutting and 1 014 metres of rising were completed during the year, some of it in connection with the development of a new settling dam and pump station on 17 level.

The first two long-hole stopes and two sub-level long-hole stopes were mined out and filled, the introduction of cemented sandfill having proved successful is now regarded as standard practice. The development of bulk mining areas is reflected in the increase in driving and cross-cutting for the year. Equipment recently acquired includes a COP 130 drifter, mounted on a Simba Senior rig and a Cavo 511 autoloader.

In other sections of the mine progress is reported with the introduction of rock bolting techniques, tests being conducted with resin and cement grouted bolts as well as conventional split wedge. Extensive tests are planned of resin anchors in bulk mining drawpoints.

Mechanisation in the older sections is developing, the three-drum electric scrapers purchased in 1973 were introduced enabling improved production.

Tests have been made on the effect of flocculant addition to the underground sand fill with promising results.

In No. 1 underlay shaft 11 level and 12 level plats were renewed and work continues steadily in replacing the old timber sets.

In No. 2 shaft the removal of accumulated spillage below 18 level is still not completed and the Mary Ann winder remains out of commission awaiting brake modifications.

Hercules Mine

Stope preparation comprising 55.9 metres of rising were completed to bring two shrinkage stopes into production, worthwhile from a labour utilisation viewpoint.

Environmental Work

The Bobadil tailings dam, flume and associated works were completed and the teething troubles in the pump station are being overcome while the dam begins to fill.

Ore Reserves

At the end of the year, the ore reserves for all mines amounted to 8 787 500 tonnes.

Safety

The upward climb in the number of accidents appears to have at least paused with a 4% drop from the previous year.

One miner was fatally injured when struck on the side of the head by his pinch bar while operating a loading chute.

Accident Statistics

Number of accidents	753
Lost days—working	8 599
Total	12 276
Man hours exposure	2 315 373
Frequency rate	325
Severity rate	5 408
Mean duration (days)	11

RISDON WORKS

R. C. Thomas, Mining Engineer, Hobart, reports that the major development work involving capital expenditure included:—

Continuation of the construction of a new fluid bed zinc concentrate roaster complex which included associated work in the Electrolytic, Roasting, Leaching and Acid Divisions.

Continued improvements to the leaching and residue treatment plants, particularly in the purification and filtering sections.

Completion of the improvements to the zinc casting, stacking and strapping equipment.

Completion of the system to collect and recover zinc dust precipitate in the cadmium division.

Provision of improved cleaning equipment for anodes and cathodes in the Electrolytic Division and a collection and recovery system for plant spillage.

Provision of covered storage for zinc slabs and a 50-tonne capacity weighbridge.

Provision of new equipment for the research and analytical laboratories and improvements to the ventilation system.

Purchase and installation of equipment for the disposal of residues.

ZIRCON

ZIRCONIUM DIOXIDE: QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value	Year	Tonnes	Value
		\$			\$
1969	6 061	340 535	1972	.....	.....
1970	4 012	333 052	1973	817	72 790
1971	2 489	217 378	1974	3 627	1 145 030
Total				17 006	2 108 785

Kibuka Mines Pty Ltd, Naracoopa

This company, reviewed under Titanium, produced 5 531 tonnes of zircon concentrates.

2. – Non-Metallic Minerals**CLAY**

QUANTITY AND VALUE OF PRODUCTION

Year	m ³	Value	Year	m ³	Value
		\$			\$
1958-1969	1 215 040	3 167 042	1972	134 918	446 036
1970	104 642	350 495	1973	113 896	393 815
1971	112 792	384 447	1974	111 487	388 069
Total				1 792 775	5 129 904

DETAILS OF PRODUCTION

Company	Clay m ³	Value \$	No. of men	Product
Agrippe Pottery Pty Ltd, Relbia	.....	.....	2	Pipes
John Campbell Pty Ltd Launceston	1 263	1 676	9	Pipes
Goliath Portland Cement Co., Railton	27 296	121 193	.....	Cement
Grierson, Dodges Ferry*	3 895	13 619	1	Bricks
Hazell Bros, Margate*	13 477	47 679	4	Bricks
Hobart Brick Co., Granton	6 794	19 144	46	Bricks
Hobart Brick Co., Kingston	2 705	8 924	1	Bricks
Humes Ltd, Granton	3 071	14 969	21	Pipes
Humes Ltd, Prospect Vale	1 603	3 206	15	Pipes
Huttons Bricks, Launceston	20 538	67 112	21	Bricks
Machens Bricks Pty Ltd, Kings Meadows	15 870	50 592	22	Bricks
G. R. Wise Launceston	407	745	.....	Pipes
Wunderlich Ltd, Launceston	7 404	20 440	1	Tiles
Zolati and Son, Dulverton	7 164	18 770	21	Bricks
Totals	111 487	388 069	164	

* Suppliers to Hobart Brick Company

Hobart Brick Co., New Town

Construction of a new tunnel kiln, capable of producing 20 million bricks per year, was started during the year and expected to be in operation in mid-1975.

DOLOMITE

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value	Year	Tonnes	Value
		\$			\$
Prior to 1970	36 210	208 844	1972	4 630	26 815
1970	3 395	20 045	1973	5 165	29 640
1971	2 558	14 406	1974	6 434	47 444
Total				58 392	347 194

Circular Head Dolomite and Trading Co. Pty Ltd, Smithton

This company, the sole producer, employed an average of four men and produced 6 434 tonnes, an increase of 1 269 tonnes. The stone is milled for top-dressing in agriculture.

KAOLIN

There has been no production since 1962. The total quantity produced since 1940 is 112 869 tonnes, valued at \$883 018.

LIMESTONE**QUANTITY, VALUE OF PRODUCTION AND USAGE**

Year	Manufacture of cement		Manufacture of carbide		Chemical and metallurgical		Agricultural and other		Totals	
	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$	Tonnes	\$
1919-1969	6 121 389	8 911 387	793 576	2 290 458	4 358 721	5 282 158	762 442	1 792 736	12 036 128	18 276 739
1970	420 602	815 496	29 120	232 029	36 668	134 035	30 976	63 425	517 366	1 244 985
1971	383 711	743 970	26 141	257 280	39 726	176 819	36 018	99 219	485 596	1 277 288
1972	471 393	913 975	25 225	258 058	53 265	286 151	39 582	102 810	589 465	1 560 994
1973	488 873	948 180	23 383	217 649	65 599	343 547	56 069	179 712	633 924	1 689 088
1974	421 145	817 020	22 487	270 331	64 333	392 620	91 746	244 924	599 711	1 724 895
Totals ..	8 307 113	13 150 028	919 932	3 525 805	4 618 312	6 615 330	1 016 833	2 482 826	14 862 190	25 733 989

Australian Commonwealth Carbide Company Ltd, Ida Bay and Electrona

This company quarried 39 680 tonnes of limestone valued at \$469 437 at Ida Bay. Of this 22 487 tonnes were used in the production of calcium carbide at the Electrona works and 17 193 tonnes were supplied to the Electrolytic Zinc Company at Risdon for metallurgical purposes.

Calcium carbide production was 10 712 tonnes valued at \$2 233 076 and acetylene black production was 203 tonnes valued at \$206 219. The average number of persons employed was 190 of whom twenty-five were employed at the quarry.

Prior to exercising an option to take over the company's operations, Kemerton Pty Ltd made a test run in the No. 2 furnace to produce ferro-silicon. This production is reviewed under Silicon.

A. R. Beams, Flowery Gully

From his quarry, crushing plant and lime kiln, Mr Beams produced—

	Tonnes	\$
Agricultural limestone	5 912	16 752
Limestone for chemical and metallurgical purposes	7 972	24 056
Burnt lime for various purposes	20	660
Total	13 904	41 468

Six men were employed.

Goliath Portland Cement Co. Ltd, Railton

A total of 412 145 tonnes of limestone with a cost value of \$817 020 was quarried and used in the manufacture of cement. An average of twenty-one men was employed in the quarry, for this production.

In addition to the above, 9 189 tonnes of limestone, valued at \$4 627 was produced for sale.

Production amounted to 311 929 tonnes of fine cement valued at \$5 622 399. An average of 314 men was employed.

Mole Creek Limestone Ltd, Mole Creek

Production was 39 106 tonnes of limestone for chemical and metallurgical purposes and 15 253 tonnes for agricultural and other purposes, of total value \$218 298. Average employment was nine men.

Railton Lime Works, Railton

Two men were employed at this works to crush and mill 9 189 tonnes of limestone, valued at \$4 627 supplied by the Goliath Company.

Wright Stephenson Pty Ltd, Pulbeena

This company produced 13 292 tonnes of lime sand, valued at \$86 517, compared with 9 649 tonnes in the previous year. Average employment was three men.

Addison & Coates, King Island

Production was 1 558 tonnes valued at \$3 072 in the first half of the year.

R. K. Sulzberger, Flowery Gully

Using a mobile crushing plant Mr Sulzberger crushed a total of 164 tonnes valued at \$1 254.

OCHRE

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1918-1969	2 688	19 554	1972	48	721
1970	42	595	1973	62	1 010
1971	71	982	1974	38	621
			Total	2 949	23 483

Mineral Supplies, Spalford and Deep Creek

Production of red and yellow ochre from these pits was 38 tonnes, valued at \$621.

PEBBLES

QUANTITY AND VALUE OF PRODUCTION

Year	Tonnes	Value \$	Year	Tonnes	Value \$
1957-1969	10 023	155 446	1972	1 716	28 714
1970	1 668	31 943	1973	824	18 088
1971	1 510	29 246	1974	1 426	35 519
			Total	17 167	298 956

Mineral Supplies, Ulverstone

The collection of pebbles for grinding was continued on the beaches around Ulverstone. The output was 1 144 tonnes, valued at \$34 091. An average of seven men was employed.

G. R. Wise, Youngtown

Production was 166 tonnes of pebbles valued at \$1 080.

SILICA**QUANTITY AND VALUE OF PRODUCTION**

Year	Tonnes	Value	Year	Tonnes	Value
		\$			\$
1936-1969	222 553	404 814	1972	16 261	45 317
1970	35 629	157 306	1973	17 101	52 679
1971	28 454	95 976	1974	25 410	74 828
Total				345 408	830 920

F. R. and C. M. Lazenby, South Arm

A total of 10 701 tonnes of silica sand, valued at \$21 392, was produced for the manufacture of glass.

Industrial Sands Pty Ltd, Eagle Point

This company continued to refine silica sands for various industrial purposes, producing 14 340 tonnes of sands in various grades and sizings valued at \$50 196. An average of five men was employed.

L. and E. Radford, Beaconsfield

A total of 92 tonnes, valued at \$184 was produced.

Mineral Supplies, Ulverstone

This firm produced 135 tonnes valued at \$2 536.

G. R. Wise, Youngtown

A total of 142 tonnes, valued at \$520, was produced.

3. — Construction Materials**BUILDING STONE****QUANTITY AND VALUE OF PRODUCTION**

Stone	Producer	<i>m</i> ³	Value (\$)	No. of men
Freestone	Etna Stone Pty Ltd, Pontville	336	51 806	9
	L. G. Holloway Round Hill	96	409	....
	Kingston Quarries	56	2 550	2
	Pontville Freestone, Molesworth	177	5 015	1
	Rizzolo Stone and Concrete Pty Ltd, New Norfolk	246	51 864	3
Other	705	1 900	....
Total		1 616	113 544	15

CRUSHED AND BROKEN STONE**Basalt****PRODUCERS, QUANTITY AND VALUE OF PRODUCTION**

Quarry	Men	<i>m</i> ³	Value (\$)
AFH, Surrey Hills .. .. .	....*	9 899	49 495
ANM, Maydena	1	5 106	25 530
APPM, Diddleum Plains	5	8 033	42 000
Brambles, Calder	16	37 844	196 210
Forestry Commission .. .. .	....*	1 327	6 635
Hobart Quarries, Bridgewater	6	97 311	543 758
St Leonards Council, Launceston	1	12 644	63 220
Talisker Blue Metals, Relbia	8	68 703	343 515
Woodfield and French, Relbia	13	59 291	296 455
Others	1	2 890	14 470
Totals	51	303 048	1 581 288

* See Gravel

Dolerite

PRODUCERS, QUANTITY AND VALUE OF PRODUCTION

<i>Quarry</i>	<i>Men</i>	<i>m³</i>	<i>Value (\$)</i>
Devon Metal Supplies, Devonport	12	11 356	61 213
Ensign Quarries Rocherlea	4	9 079	45 395
Electrolytic Zinc Co., Risdon .. .. .	....*	14 127	70 635
Forestry Commission	11	36 504	182 520
Glenorchy Quarries	5	40 411	202 055
Hobart Quarries	41	166 572	839 080
Huon Council, Huonville	1	4 762	23 810
C. R. Johnson, Cambridge .. .. .	....	2 874	14 370
Launceston Quarries, Mowbray	14	111 011	584 860
Pioneer Quarries, Flagstaff Gully	16	61 603	311 520
R. K. Sulzberger, Launceston	1	3 109	15 545
Others .. .. .	....	771	3 855
Totals	105	462 179	2 354 858

* See Zinc

Hobart Quarries Pty Ltd, New Town

A total of 166 572 m³, valued at \$839 080 was produced at the Giblin Street quarry. The average number of persons employed in the quarry was forty-one.

Capital expenditure at the quarry was:—

	\$
AC crusher	36 000
Vehicles	20 000
Total	56 000

Limestone

PRODUCER, QUANTITY AND VALUE OF PRODUCTION

<i>Quarry</i>	<i>Men</i>	<i>m³</i>	<i>Value (\$)</i>
G. J. Weily, Glenorchy	7	16 121	81 105

Sandstone

PRODUCER, QUANTITY AND VALUE OF PRODUCTION

<i>Quarry</i>	<i>m³</i>	<i>Value (\$)</i>
Rizzolo Stone and Concrete Pty Ltd	15	324

Other Stone

PRODUCERS, QUANTITY AND VALUE OF PRODUCTION

<i>Quarry</i>	<i>Men</i>	<i>m³</i>	<i>Value (\$)</i>
Forestry Commission .. .. .	....*	14 765	73 825
L. G. Holloway, Round Hill	2	3 672	18 360
Hydro-Electric Commission, Strathgordon	30	76 041	380 205
C. R. Johnson, Cambridge .. .. .	....	3 709	18 545
Readymix, Merseylea	2	11 825	100 306
Shields Quarries, Rokeby	1	1 537	7 685
Transport Commission, Launceston .. .. .	....	1 813	9 065
Others .. .. .	....	568	2 840
Totals	35	113 930	610 831

* See Dolerite

GRAVEL

PRODUCERS, QUANTITY AND VALUE OF PRODUCTION

<i>Pit</i>	<i>Men</i>	<i>m³</i>	<i>Value (\$)</i>
AFH, Surrey Hills	6	59 244	118 488
Beaconsfield Council	2	19 786	39 572
Brambles, Burnie	....*	29 341	87 258
Broken Hill Pty Co. Ltd, Beaconsfield	....†	23 824	47 648
Circular Head Council	2	39 293	78 586
Deloraine Council	2	15 147	30 294
Devonport Council	2	53 196	106 392
Fingal Council	1	17 377	34 754
Flinders Island Council	1	11 597	23 194
Forestry Commission	5	57 512	115 024
George Town Council	3	26 042	52 084
Hamilton Council	2	16 906	33 812
Kentish Council	1	11 959	23 918
Latrobe Council	6	18 440	36 880
Longford Council	2	15 775	31 550
Oatlands Council	2	15 440	30 880
Penguin Council	2	12 288	24 576
Portland Council	2	22 843	45 686
Public Works Department	130	730 000	1 460 000
Richmond Council	2	10 811	21 622
Ringarooma Council	1	10 553	21 106
Scottsdale Council	2	10 557	25 720
Spring Bay Council	1	10 632	21 270
St Leonards Council	1	14 773	29 546
Ulverstone Council	2	23 151	46 302
Westbury Council	1	23 637	47 274
Woodfield and French	39	60 821	174 994
Others	42	157 728	401 132
Totals	262	1 518 673	3 209 562

* See Basalt

† See Woodfield and French

SAND

PRODUCERS, QUANTITY AND VALUE OF PRODUCTION

<i>Pit</i>	<i>Men</i>	<i>m³</i>	<i>Value (\$)</i>
L. W. and I. M. Bassett, Launceston	....*	2 229	10 414
R. R. P. Cousins, Beauty Point	8	20 021	124 419
Devon Metal Supplies, Devonport	....†	8 346	30 447
Flinders Island Council	....*	3 574	7 148
G. Gerke, Scottsdale	....*	1 400	6 300
Hobart Quarries, South Arm	....†	21 545	44 060
L. King Pty Ltd, Devonport	....*	5 824	20 679
C. A. Long, South Arm	3	26 127	52 254
G. L. Males, South Arm	2	5 648	29 760
Scottsdale Council	....*	1 607	4 060
Stubbs Sand and Gravel Pty Ltd, Devonport	1	10 445	41 532
L. A. Swain, Perth	2	11 729	23 458
C. G. Turmine, Perth	1	1 756	3 512
Woodfield and French, West Tamar	....*	1 405	5 561
Others	3	6 558	17 319
Totals	20	128 214	420 923

* See Gravel

† See Dolerite

OTHER ROAD MAKING MATERIAL
PRODUCERS, QUANTITY AND VALUE OF PRODUCTION

<i>Pit</i>	<i>Men</i>	<i>m³</i>	<i>Value (\$)</i>
Campbell Town Council .. .. .	....*	1 132	2 264
Cleveland Tin N.L., Luina .. .. .	....†	4 488	8 976
Evandale Council .. .. .	....*	1 021	3 570
C. R. Johnson, Cambridge .. .. .	....*	7 888	15 776
Longford Council .. .. .	....*	1 107	2 214
Mt Lyell Mining and Railway Co. Ltd, Queenstown	4	37 207	148 828
Ross Council .. .. .	....*	1 855	6 668
Savage River Mines .. .. .	....‡	4 112	11 245
Spring Bay Council .. .. .	....*	5 445	10 890
Wynard Council	1	7 708	15 416
Zeehan .. .. .	....*	5 225	10 450
Others	2	3 759	9 415
Totals	7	80 947	245 712

* See Gravel

† See Tin

‡ See Iron Ore

4. — Fuel Materials

COAL

QUANTITY AND VALUE OF PRODUCTION

<i>Year</i>	<i>Tonnes</i>	<i>Value</i> \$	<i>Year</i>	<i>Tonnes</i>	<i>Value</i> \$
Prior to 1970	9 848 433	25 506 278	1972	132 242	589 015
1970	126 497	617 565	1973	114 588	530 875
1971	123 922	600 140	1974	127 460	678 665
			Total	10 473 142	28 522 538

W. R. Tindal, Mining Engineer, Hobart, reports that there has been an increase in production of 12 872 tonnes. The number of employees increased from forty-nine to fifty-six, of whom twenty-eight were employed underground. The production per man year increased from 4 092 to 4 552 tonnes for underground employees, but decreased from 2 339 to 2 276 overall.

Duncan Coal Mine, Fingal

Production has been obtained from an area in the original lease of the Duncan mine, skirting along the old worked area. Production was 127 460 tonnes, an increase of 17 440 tonnes, with a complement of fifty-six employees, giving a decrease in overall production per man year from 2 445 to 2 276 tonnes.

5. — Foreign Ores

The total value of the metallurgical products of four large works treating foreign ores imported into Tasmania was approximately \$145 802 921.

ALUMINIUM

Comalco Aluminium (Bell Bay) Ltd, Bell Bay

In the production of 86 078 tonnes of aluminium, 3 402 tonnes of Weipa bauxite and 161 790 tonnes of imported alumina were processed.

Other products were: 8 052 tonnes of aluminium hydrates and 4 729 tonnes of alumina. Average employment was 1 156 men.

FERRO-MANGANESE**Tasmanian Electro-Metallurgical Co. Pty Ltd, Bell Bay**

During the year 73 851 tonnes of manganese ore from Groote Eylandt was smelted to produce 63 706 tonnes of manganese alloys for the steel industry.

The alloys were 421 333 tonnes of high carbon ferro-manganese and 21 573 tonnes of silicon-manganese reported under Silicon.

Accidents

Average number of employees	146
Man hours exposure	313 185
Number of accidents	Nil

TITANIUM DIOXIDE**Tioxide Australia Pty Ltd, Heybridge**

Production of titanium dioxide from Western Australian ilmenite was comparable to that of last year.

Capital expenditure increased by 36% and included the installation of a Hardinge mill, equipment associated with a 10% acid dilution plant, progressive work on the installation of digester gas scrubbing equipment, modifications to the wharf crane at Burnie harbour and improvements to the iron-bearing drainage collection system.

There were eleven reportable accidents. One serious accident occurred when one of the maintenance crew fell through the asbestos sheet roof over the digester area and sustained multiple injuries when he landed on top of a closed digester. Average number of employees—461.

Accident Statistics

Accidents	11
Days lost—	
Calendar	198
Working	141
Man hours	860 067
Frequency rate	13
Severity rate	229
Mean duration (days)	13

ZINC, CADMIUM, COBALT OXIDE AND SUPERPHOSPHATE**Electrolytic Zinc Company of Australasia Limited, Risdon**

This company, described under Zinc, produced zinc from Broken Hill concentrates 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 Chief Geologist, I. B. Jennings, B.Sc. (Hons), A.M.Aust.I.M.M.

The major achievements during the year were the compilation of 1 : 250 000 geological sheets covering the whole of the State, compilation of a new geological map of the State at a scale of 1 : 500 000, increased activity in landslip studies including proclamation of some areas, continuation of the systematic assessment of the groundwater potential of the State and a continuation of studies directed toward the discovery and assessment of the economic mineral deposits of the State.

Over the past few years various attempts have been made to improve and expand the library and information services within the Branch. As reported in previous years the Branch holds large quantities of important data which are in demand by departmental staff, mining and exploration companies, students and the public. The data collection is poorly housed and inadequately indexed. Lack of continuity of suitable trained staff and insufficient proper accommodation are the chief barriers to progress in this field. The accommodation problem is the most pressing factor but despite all efforts no real progress has been made in this field. The time is rapidly approaching when better and more adequate accommodation must be found otherwise the library will cease to function. In order to provide continuity of trained staff for the library an agreement has been made whereby the State Library will in future provide the professional staff for the departmental library. The present indications are that the agreement will be of considerable benefit to the Department as it allows access to a pool of trained information scientists. However progress will continue to be limited by accommodation.

Proclamations of landslip areas under section 431A of the Local Government Act were initiated during the year. As expected, the proposals drew a large number of objections and some adverse criticism from the press. In the case of the small areas dealt with so far, each objection has been carefully dealt with on an individual basis. In the future, large areas will be subject to this procedure and it is anticipated that increasing criticism from objectors, the press and various pressure groups will be encountered. The problems to be dealt with are exceedingly time consuming and it has been necessary for officers to deal not only with individual objectors but also local progress associations, Real Estate Institute members, groups of solicitors, valuers and others. This has brought the officers of the Branch into direct confrontation with the public and groups having various interests in land or land dealings. The problems are complex and not solely technical in nature, the solutions offered will not be readily accepted by all, particularly those whose property values are affected. Nevertheless it is felt that some process should be applied in order to protect the buying and building public and to prevent the spread of urban development onto areas which will inevitably fail by landslipping unless some control is exercised. In the immediate future there seems to be a real danger that the staff of the Branch who deal with these matters will become so engrossed in dealing with objectors, pressure groups and minor enquiries that they will not be able to pursue the scientific studies necessary to define the zone boundaries already tentatively drawn and at the same time carry out the necessary research into landslip phenomena.

In all fields of work in which the Branch is engaged substantial progress has been made as outlined in the following reports by supervising geologists, specialists and heads of sections.

Scholarship holder D. J. Sloane graduated with Honours at the end of the year and will join the staff early in 1975.

REGIONAL GEOLOGY

Supervising Geologist E. Williams reports—

Progress during the year in regional geological mapping was as follows:—

1 : 250 000 Map Series

Launceston Sheet has been published and the Explanatory Notes are in press. Queenstown, Hobart, Oatlands, Port Davey and King Island-Flinders Island Sheets are being drafted for publication. Explanatory Notes for the Queenstown Sheet are in preparation.

1 : 500 000 Map of Tasmania

This Sheet is being drafted for publication.

1 : 50 000 Map Series

Lake River and the Brighton Sheet have been drafted for publication.

Scottsdale Sheet and Oatlands Sheet are being drafted for publication.

Kingborough Sheet: Senior Geologist N. Farmer continued mapping in this area.

Sorell Sheet: Senior Geologist A. B. Gulline continued work in this region.

Strahan Sheet: Geologists P. W. Baillie and S. F. Cox continued work in this area.

Huntley Sheet: Geologists M. McClenaghan, J. McClenaghan, A. V. Brown and N. J. Turner continued studies of the Lake Gordon region.

Explantatory Notes have been published for the 1-mile Beaconsfield Sheet. Notes are being edited for the Burnie and Sheffield Sheets and for the 1 : 50 000 Brighton Sheet. Reports for 1-mile Mackintosh, Frankford and Pieman Heads Sheets are being prepared. Geologist S. M. Forsyth has commenced preparing notes for the 1 : 50 000 Oatlands Sheet.

ECONOMIC GEOLOGY

Supervising Geologist A. J. Noldart reports—

The staff of the section comprised a supervising geologist, two senior geologists and two geologists. One geologist was absent on Ph.D. studies at the University of Tasmania.

The following activities were carried out during the year:—

METALLICS

- (a) Continued investigation of detrital tin deposits in the north-eastern districts generally.
- (b) Continued investigation of granite rocks and associated mineralisation in the eastern and north-eastern districts.
- (c) Continuation of studies relating to the distribution and geochemistry of granitic rocks on Cape Barren Island and associated detrital deposits.
- (d) Completion of the compilation of Bulletin 55—'The Geology, Geochemistry and Mineralisation of the Blue Tier Batholith, north-eastern Tasmania'.
- (e) Completion of exploratory diamond drilling at the Cambria mine, Blue Tier and commencement of drilling at Oliver Hill.
- (f) Continuation of studies of carbonate alteration at Moina and other areas for guides to potential mineralisation.
- (g) Detailed assessment of tin deposits in the Friendly Beaches-Bluestone Bay area. Examinations of mineral prospects and small workings throughout the State. Examination of mineral potential of areas under application for purchase from the Crown and advice to prospectors generally.

FUEL MINERALS

- (a) Continuation of exploratory diamond drilling for coal in the Fingal-Merrywood area.
- (b) Continuation of studies in the Duncan coal mine, Fingal.
- (c) Conversion of all drilling and related data to metric units for correlation purposes.

NON-METALLICS

- (a) Continuation of construction materials survey and register from records of Government departments, municipal councils and private industry.
- (b) Field investigations to complement the above records.

- (c) Completion of field investigations and sampling of the Flowerdale-Calder River gravels.
- (d) Supervision of exploratory drilling for limestone reserves in the Railton and Mole Creek districts for private enterprise.
- (e) Miscellaneous investigations on behalf of Government and semi-governmental authorities and general advice to the extractive industry throughout Tasmania.

GENERAL

- (a) Continuation of studies of the Cambrian succession in the Mt Lyell-Rosebery mineralised belt and mineral relationships.
- (b) Continued investigation of mineralisation in the Chester-Pinnacles district and trace element studies of pyrite from the Chester mine.
- (c) Continuation of compilation of the economic appendix for the explanatory notes on the Mackintosh map sheet and related field work.
- (d) Commencement of investigations into the economic potential of areas affected by possible power development in the Lower Gordon River and the King-Franklin river system together with sampling programs.
- (e) Continuation of field work and compilation of data on the Bass Strait islands for the 1 : 250 000 and 1 : 500 000 map sheets.
- (f) Liaison was maintained with mineral exploration companies throughout Tasmania and investigations of works in progress carried out in association with company staff.

ENGINEERING GEOLOGY

Supervising Geologist P. C. Stevenson reports—

The staff of the section comprised a supervising geologist, two senior geologists and two geologists, and was augmented by the appointment of Technician H. Hinson in March.

The major groundwater investigation has been at Devonport and Port Sorell, but other investigations of some extent have been at King Island, Sorell and North West Bay. Thirty reports on groundwater subjects have been written.

Landslip work has been intense with continual requests for examinations of building blocks. More productive scientific work on the St Leonards, Wanstead and Deviot slips has been done to reveal the nature of these failures, as well as some tests to show the effect of traffic vibrations on active movement at Lawrence Vale; twenty-six reports have been written. Meetings of the Real Estate Institute and of the Valuation Branch have been addressed on the landslip problem. A significant investigation has been into the nature of the Tamar clays by X-ray diffraction methods, and a zone plan for Boat Harbour has been produced. Meetings of objectors under the Local Government Act were held and decisions made.

Other work has included mapping of representative catchments at Esperance, Sandfly Creek and Birralee Creek, a gravity survey of the Rossarden area, and investigation of a dam site and pipeline route for water supply at Port Arthur and examinations of foundations at Electrona and at Macquarie Plains railway bridge.

GEOPHYSICS

Geophysicist D. E. Leaman reports—

The year has been noteworthy for the diversification in type of work undertaken and techniques employed.

ORE DEPOSITS

A detailed gravity survey was completed in the Rossarden-Storeys Creek region and testing of induced polarisation methods was undertaken at a prospect near Claude Road.

OTHER DEPOSITS

The gravity survey with associated mapping and drilling was continued south of Fingal-St Marys as part of a project to evaluate coal reserves.

Several quarries and quarry sites in the Hobart area were qualitatively examined with detailed assessments undertaken at Giblin Street and Glenorchy.

REGIONAL PROJECTS

Numerous seismic and magnetic surveys were undertaken in southern Tasmania to guide and assist in mapping projects. In particular a magnetic survey of the Derwent estuary was begun and magnetic anomalies at Port Cygnet were evaluated.

ENGINEERING AND GROUNDWATER

Most geophysical work related to this subject is undertaken by the Engineering Geology Section and only specialist and research problems are handled by the Geophysics Section. However reflection and induced polarisation methods were assessed for possible use in this area.

Detailed assessment of rock vibration related to the quarry operations in Giblin Street was also undertaken.

Seismic surveys were used at St Helens to assess the nature of the sand bar.

GENERAL AND DEVELOPMENTAL

Work was begun on a rigorous magnetic evaluation of Tasmania's ubiquitous dolerites. The control area for the study is the foreshore at Rosny.

MAPPING AND ENGINEERING DRAUGHTING

Senior Draughtsman D. M. Hardy reports—

C. A. Meech joined the section in April and P. J. Donnelly resigned in November.

D. M. Hardy attended the Chief Draughtsman's Conference in Melbourne early in the year. A wide range of subjects relating to mapping were discussed.

The following progress was made on colour map productions:—

The Geology of the Blue Tier Batholith was printed in twelve colours.

The Mt William-Eddystone Pt map was printed in seven colours.

The 1 : 50 000 Series

Lake River Sheet No. 54: Finished and will be printed early in 1975.

Brighton Sheet No. 75: Finished and will be printed early in 1975.

Kingborough Sheet No. 88: Fair drawing proceeding.

Ringarooma Sheet No. 32: Fair drawing proceeding.

The 1 : 250 000 Series

Launceston SK55-4: Near completion, should be printed early in 1975.

Queenstown SK55-5: Fair drawing proceeding.

Hobart SK55-8: Fair drawing proceeding.

Oatlands SK55-6: Fair drawing proceeding.

Work on the 1 : 500 000 Geology of Tasmania has commenced but is proceeding slowly.

Two multi-colour maps showing the geology of the Red Hills-Newton Creek area were produced. As only fifty copies of each were required, the silk screen printing process was used with good results.

Six landslip maps at a scale of 1 : 15 840 covering the Tamar Valley were produced and are available in dyeline form.

The balance of time was used in drawing ninety geophysical, geological, palaeontological and engineering plans and diagrams for technical reports, geological survey bulletins and normal field services.

SURVEYING

Surveyor G. Benn reports—

The following surveys were carried out during the year:—

- (a) Continuation of surveying and levelling of diamond drill holes at Fingal.
- (b) Continuation of surveying and levelling in the Duncan mine and surveying at the New Stanhope mine.
- (c) Continuation of surveying and levelling of landslips in the St Leonards and Tamar Valley district.
- (d) Continuation of surveying and levelling at Aberfoyle mine, Rossarden.
- (e) Survey carried out of the Flowerdale gravel quarries at Wynyard.
- (f) Survey carried out at the Talisker blue metal quarry, Launceston.
- (g) Survey and levelling of seismic surveys at Electrona and Goat Bluff.
- (h) Surveys carried out at the old coal mines, Jubilee, Cardiff, Seymour and Dalmayne.
- (i) Plans prepared of all surveys.

MINERALOGY AND PETROLOGY

Mineralogist and Petrologist G. Everard reports—

Suites of Cambrian rocks were examined in thin section including Mt Read volcanics and collections from the Red Hills-Gooseneck area. Other rocks investigated came from Lemont and the Glen, south of Cressy.

Cuttings from bore No. 1 Target Flat, Rushy Lagoon were examined in thin section. Limestone DDH core from Dalmayne was examined for Industrial and Mining Investigations. DDH core from Comstaff CP3 south of the old Chester mine was examined in thin section.

Petrological descriptions of sandstones from Long Marsh and Ross were supplied to the Public Works Department.

Concentrates from Pioneer mine and from BMI investigations, Ringarooma River were microscopically examined, and clay samples from bores Nos. 1 and 2 Dalmayne and bore No. 22 Railton were investigated.

The pitting of the granite rollers used by ANM at Boyer was investigated by making an examination of the rollers at work in the papermaking machines and during resurfacing in the workshop.

Rocks, mineral and concentrates to the number of forty different specimens were examined and reported on for members of the general public and specimens in mineral collections were identified for collectors. Various inquiries of a technical nature were attended to.

GEOCHEMISTRY

Geochemist W. E. Baker reports—

Some 4 500 element analyses were carried out for a variety of elements in soils, stream sediments and humic material.

Detailed sampling in the vicinity of Mt Roland gave a more confined location to a linear distribution of anomalous copper values which appears to be related to the presence of a mineralised shear zone. Drilling of this area is planned for 1975.

Analysis of gossan in a drill hole at Oliver Hill revealed that this contained 7% Pb. This value far exceeds that found in surface samples but to date there has been no indication of significant sulphide occurrences.

Attempts to check the continuity of lode formations exposed north-west of Zeehan by grid sampling were not very successful. This problem will be examined by carrying out analytical work in the field during 1975.

The X-ray diffraction equipment continues to operate successfully in qualitative studies. Extension of the facilities to quantitative problems has been delayed because the manufacturer supplied accessories that were not compatible with the X-ray plant.

Several projects had to be abandoned due to possible hazards for staff under the appalling laboratory conditions which have now continued for a period of five years. An additional problem relating to the housing of the geochemical facilities in part of a drill store has been contamination of the lower trace level. This has prevented the use of carbon rod techniques for anything other than exotic elements.

PALAEONTOLOGY

Palaeontologist M. J. Clarke reports—

Work has proceeded well in several areas. Again the major investigations have involved the study of Permian marine assemblages principally in the Sorell, Kingborough, Lake River, Hobart, Dover, Oatlands, Brighton and Strahan Quadrangles. Important discoveries include a well-preserved and complete specimen of the unusual crinoid *Camptocrinus*, and the inarticulate brachiopod *Orbiculoidea* and the bivalve *Astartella* are definitively recorded from the Tasmanian Permian for the first time. Vertical distributions of the syringothyroid *Pseudosyrinx*, the taxodont *Phestia* and the rostroconch *Conocardium* have been significantly extended beyond previously known limits. The high Ferntree Mudstone fossil horizon is now known to occur over a very extensive area in south-east Tasmania. One such new locality is Point Puer. This locality is of considerable historical and taxonomic importance since it is the type locality of *Productus brachythaera* which is the genotype of the linoproductid *Terrakea*, a genus based on material originally collected by the Polish explorer Strzelecki in 1845. The Point Puer material taken in conjunction with well-preserved, uncrushed and silicified material from Mt Dromedary, clearly demonstrates that *Terrakea solida*, a common Queensland Mantuan species, is mature and gerontic *T. brachythaera*. This conclusion not only removes a source of considerable taxonomic confusion, but also adds weight to the now generally accepted age equivalence of the youngest Tasmanian and Queensland marine Permian faunas. Work has also commenced on a compilation of the faunal diversity of Tasmanian Permian faunas. Faunal diversity can be used as a reasonably accurate indicator of water temperatures (and thus inferentially of palaeoclimates). Preliminary results show (1) faunal diversity is consistently low to very low (implying cool to cold conditions throughout), (2) a small but significant increase in diversity is apparent above the Mersey Coal Measures and their equivalents, (3) rather surprisingly that faunal diversity reaches a peak in the Malbina Formation and not in the Berriedale Limestone, and (4) that there are no wide variations in faunal diversity necessary to support the thesis of alternating cold and warm conditions as advocated by certain workers. Preliminary comparisons with similar data for New South Wales, Queensland, Western Australia and the Salt Range, Pakistan reveal a consistent trend of increasing diversity away from Tasmania which agrees well with palaeomagnetic data and the climatic deductions therefrom.

Well-preserved faunas indicate important structural complications within June/June/Eldon Group correlates of the King River area. Unfortunately the absence of palaeontological control in the lower parts of the Eldon Group correlates has hampered a detailed understanding of the stratigraphical details.

The assistance of several outside experts is gratefully acknowledged. Dr J. B. Jago (South Australia) has confirmed the presence of Late Cambrian (Franconian) trilobite faunas with strong Asiatic affinities in the Huntley Quadrangle. Dr R. Helby (Geological Survey, New South Wales) and Dr E. M. Kemp (Bureau of Mineral Resources, Canberra) have conducted a number of palynological examinations of Tasmanian material. Their results show (1) the presence of definitive Stage 1 *Potonieisporites* (Late Carboniferous) microfloras, in basal tillitic sequences at Wynyard, the Hellyer Gorge and Strahan, (2) that Stage 2 *Striatites* microfloras accompany the incoming of the *Eurydesma-Glossopteris* (Permian) association, and (3) that the Mersey Coal Measures equate approximately with Stage 3 *Vittatina* microfloras. All these findings accord well with the macropalaeontological criteria.

LIBRARY

Librarian Miss G. L. Davies reports—

During 1974, seventeen new serial titles and 158 new monographs were added to the library.

The equipment for the Termatrix optical coincidence information storage and retrieval system arrived early in the year, but due to the extreme shortage of space and to the lack of an adequate thesaurus for our purposes, indexing for the system has not yet commenced. We hope that the thesaurus problem will be answered by the Australian Mineral Foundation's proposed thesaurus of Earth Science Terms, when completed; but the space problem seems to be insurmountable. The library becomes increasingly difficult to operate efficiently in terms of storage of material, adequate work space for staff, and adequate seating arrangements for users. Until the Termatrix System can be introduced, and some inroad made into the large backlog of material to be indexed, a card index to departmental unpublished reports is being maintained; and Mr Mark Bennett of the State Library of Tasmania has re-indexed the Department's publications for the use of the State Library and the Department. This has proved to be very helpful.

The arrangement whereby the State Library provides professional staff, and orders monographs for the Department is working well, although the agreement regarding handling of serial subscriptions appears to have met certain administrative problems.

Our thanks are due to Miss Gilbert and Miss Durrant of the State Library of Tasmania for their help and advice during the year.

PUBLICATIONS

Publications Officer E. L. Martin reports—

The following publications were printed during the year:—

- Geological Survey Explanatory Report, 1 : 63 360 Sheet 30, Beaconsfield, by R. D. Gee and P. J. Legge, with contributions by M. J. Clarke, A. J. Noldart, P. C. Stevenson and V. M. Threader.
- Geological Survey Explanatory Report, 1 : 250 000 Sheet SK-55/3, Burnie, by E. Williams and N. J. Turner.
- Technical Reports No. 17 (for 1972).
- Notes on procedures for occupation of land for mining purposes (7 ed.).
- Occurrences of gemstones in Tasmania (3 ed.).

Eighty-three Unpublished Reports were issued during the year. Thirty-six typescript reports issued in 1972 and which had not been printed in Technical Reports were also prepared as Unpublished Reports.

B. R. Mills commenced work as Assistant Publications Officer in March but left to take up an appointment with the University of Tasmania in August. He was succeeded by J. A. Bates who commenced work in November.

Several programs were compiled for use with the Wang 700 computer, including those for the evaluation of alluvial tin data, a graph plot routine with automatic scaling, the production of profiles from delay-time seismic refraction data, the transformation of AMG to ANG co-ordinates, and the calculation of the areas of mining leases from grid co-ordinates.

NON-DEPARTMENTAL PUBLICATIONS

The following articles by members of the Geological Survey staff* were published during the year:—

- CLARKE, M. J.* 1974. Certain misconceptions concerning Late Palaeozoic rocks in Tasmania. *Geol. Mag.* 111:565-566.
- CLARKE, M. J.* 1974. Comments on *Terrakea brachythaera* (Mortis) and *Terrakea solida* (Etheridge and Dun). *Newsl. int. Gondwana Subcommn.* 3.
- CORBETT, K. D.*; REID, K. O.; CORBETT, E. B.*; GREEN, G. R.*; WELLS, K.; SHEPPARD, N. W. 1974. The Mount Read Volcanics and Cambrian-Ordovician relationships at Queenstown, Tasmania. *J. geol. Soc. Aust.* 21:173-186.
- FORSYTH, S. M.*; FARMER, N.*; GULLINE, A. B.*; BANKS, M. R.; WILLIAMS, E.*; CLARKE, M. J.* 1974. Status and subdivision of the Parmeener Super-group. *Pap. Proc. R. Soc. Tasm.* 108:107-109.

CHEMICAL AND METALLURGICAL BRANCH

Report of the Chief Chemist and Metallurgist, H. K. Wellington, B.E., F.S.A.S.M., A.M.Aust.I.M.M.

The number of samples handled was greatly reduced although the number of determinations remained about the same as in 1973. The ratio of determinations to samples registered (4.04) was the highest ever recorded.

While the number of tin determinations was again more than that of any other element, it was greatly reduced. The following elements were determined in numbers greatly exceeding past levels: arsenic, cadmium, calcium, chromium, lead, magnesium, mercury, nickel and zinc.

Included in the above determinations were ninety-two complete rock analyses. However the elements and other determinations made on the water samples shown have not been listed. Generally a complete water analysis involves about ten components and a partial analysis about three.

TYPE AND NUMBER OF TESTS			
<i>Type of Test</i>	<i>Number</i>	<i>Type of Test</i>	<i>Number</i>
I. QUANTITATIVE—		Zinc	508
Elements—		Zirconium .. .	69
Aluminium .. .	135		8 783
Antimony .. .	40	Waters*—	
Arsenic .. .	293	Complete analysis .. .	147
Barium .. .	47	Partial analysis .. .	368
Bismuth .. .	3	Deposit gauges .. .	148
Boron .. .	10		663
Bromine .. .	11	Miscellaneous—	
Cadmium .. .	142	Ash (coals) .. .	126
Calcium .. .	462	Calorific value .. .	21
Carbon (including CO ₂)	12	Grit (clays) .. .	15
Chlorine .. .	12	Ignition loss .. .	115
Chromium .. .	239	Insoluble .. .	6
Cobalt .. .	166	Moisture .. .	54
Copper .. .	630	Radicals and complexes ..	12
Fluorine .. .	24	Total salts in bricks .. .	31
Gold .. .	487	Volatiles (coals) .. .	27
Iodine .. .	11		407
Iron .. .	515	II. QUALITATIVE .. .	24
Lead .. .	466	III. CERAMIC—	
Lithium .. .	93	Clay determination .. .	255
Magnesium .. .	393	Fusion point .. .	57
Manganese .. .	276	Moisture .. .	21
Mercury .. .	136	Brick test .. .	63
Molybdenum .. .	57		396
Nickel .. .	378	IV. METALLURGICAL—	
Nitrogen .. .	12	Crushing and grinding ..	3
Phosphorus .. .	156	Density .. .	10
Rubidium .. .	68	Flotation .. .	1
Selenium .. .	18	Heavy liquid separation	99
Silicon .. .	172	Heavy metal solubility	
Silver .. .	204	curves .. .	9
Sodium .. .	137	Magnetic separation .. .	12
Strontium .. .	68	pH .. .	3
Tin .. .	1 463	Sizing .. .	541
Titanium .. .	137	Tabling .. .	4
Tungsten .. .	112		682
Uranium .. .	32	Total .. .	10 955
Vanadium .. .	64		
Yttrium .. .	68		

* See notes preceding this table

RESEARCH INVESTIGATIONS

Tin	1	Copper	1
Gold	3	Ceramics	2
Tungsten	1	Kaolin	1
Coal	1	Dolomite	1
		Total	11

SUMMARY OF INVESTIGATIONS

Tungsten

R.674—Minefields Exploration N.L., Mt Mulgine, Western Australia

Before concentration testing began there was considerable sampling work to establish the grade of the diamond drill core supplied.

A composite sample, which was made from the large diameter core from the two highest grade intersections, and which assayed 0.3% WO_3 was concentrated by gravity and magnetic separation to a scheelite concentrate assaying 66.6% WO_3 . The tungsten recovery in this concentrate was 72%.

Gold

R.675—Director of Mines, Tailing Dumps at Beaconsfield

A preliminary examination was made to examine the application of activated carbon to the cyanide pulp to recover the gold from solution. The method was effective.

R.682—H. Moses, Special Tailing Dump Materials, Mathinna

A sample from the surface of a very old dump assayed 40 g/t of gold. Screening on 600 μ m yielded 93% of the gold in the retained coarse fraction which also contained a third of the original mass. This fraction assayed 100 g/t Au, 5% As, 4.6% S.

Amalgamation on this fraction recovered only 35% of the gold. However, flotation of this fraction recovered 99% of the gold in a sulphide concentrate from which after roasting and amalgamation 78% of the gold was recovered.

R.684—Allstate Exploration N.L., Beaconsfield

A preliminary assessment of metallurgical treatment and problems has been made using the very limited amount of material provided by five diamond drill intersections of the lode by departmental and company drilling at the old Tasmania mine.

The five samples used varied considerably in both nature and assay (11-90 g/t Au).

Coarse gold when present can be recovered by jigging. There are likely to be some problems with copper flotation. A rougher copper concentrate was made assaying 15% Cu and 400 g/t Au. A pyrite concentrate, which contained appreciable gold, was made.

There was little correlation between the behaviour of the five samples.

Tin

R.685—Minops Pty Ltd, Razorback Mine, Dundas

Twelve samples taken from across the area to be mined were submitted for cassiterite grain size determination as a preliminary to concentration tests.

Only six samples contained sufficient tin to warrant testing. In those six talc and clay made the dissolution of the rock forming material difficult.

The tests showed 53-73% of the cassiterite grains were of a size suitable for gravity recovery.

Copper

R.683—S. R. M. Harvey, Macquarie Harbour Sediments

Samples from the top 4 metres of sediment and of the top sulphide-rich layer at the northern end of the harbour were submitted for analysis and concentration.

Flotation tests on the sulphide rich material (880 g/t Cu) yielded 54% of the copper in a concentrate assaying 0.56% Cu. However concentration beyond this was unsuccessful.

Coal

R.689—Cornwall Coal Co. N.L., Fingal Washery

Laboratory continuous flotation cells were installed at the washery to test the recovery of coal from what are presently waste products.

From a feed assaying 30% ash a product containing half the mass and assaying 25% ash was obtained. Batch cleaner flotation on this produced a final coal assaying 16.4% ash and containing 22% of the mass in the original feed.

Ceramics

R.676—Director of Mines, Annual Survey of Brick Production

The brick production from all the producers in the State was surveyed in December 1973.

R.683—S. R. M. Harvey, Macquarie Harbour Sediments

The sulphide-free tailing produced in the copper investigation above was examined for its brickmaking capability but was not found satisfactory.

Kaolin

R.677—Associated Pulp and Paper Mills Ltd, Tonganah

A sample of clay was submitted for the production of filler and coating clays. These objectives were not met.

Dolomite

R.687—Circular Head Dolomite and Trading Co., Smithton

The present operation was assessed and proposals made for expanding production to meet an export market as well as the local demand for dolomite as a fertiliser.

MINES AND EXPLOSIVES BRANCH

Report of the Deputy State Mining Engineer and Deputy Chief Inspector of Mines and Explosives,
P. M. Johnstone, B.E., M.Aust.I.M.M.

The Mines Inspection Act 1968

EMPLOYMENT

The average number of persons employed in the mining, metallurgical and quarrying industry was 10 103, an increase of thirty. The number of men employed underground rose by 7% to 1 477. This increase was due to a changeover by the Mount Lyell Mining and Railway Co. Ltd and King Island Scheelite (Warman International Ltd) from open-cut to underground mining.

ACCIDENTS

Accidents were reported and recorded in accordance with Australian Standard CZ6, Recording and Measuring Work Injury Experience. By this practice all disabling injuries causing the loss of one shift or more are recorded. In calculating the rates, 130 employees in the total of 10 103 were disregarded because their employers do not submit accident reports.

The number of accidents was 2 001 in which 2 002 men were injured and six killed.

ACCIDENT STATISTICS (A.S. CZ6)

<i>Employer</i>	<i>Man-hours exposure</i>	<i>No. of injuries</i>	<i>Frequency rate</i>	<i>Days charged</i>	<i>Severity rate</i>	<i>Mean duration (days)</i>
Aberfoyle	278 678	75	269·1	907	3 255	12
BMI	34 799	2	57·5	7	201	4
Cleveland	422 801	60	141·9	857	7 830	14
EZ, Rosebery	2 315 373	753	325·0	12 276	5 408	11
Kibuka	104 372	10	95·8	80	766	8
King Island	767 743	86	112·0	847	1 103	10
Mt Lyell	2 808 602	243	86·5	21 990	7 830	12
Renison	743 425	150	201·8	1 641	3 029	11
Ringarooma	44 148	2	45·0	7	155	4
Savage River	816 642	53	64·9	513	1 282	10
All mines	8 336 583	1 434	172·0	39 125	4 693	12
Carbide	312 401	65	208·1	927	4 155	14
Comalco	2 389 164	63	26·4	657	5 298	10
EZ, Risdon	4 137 927	319	77·1	1 757	595	6
Goliath	645 104	1	1·6	3	6	3
Mole Creek	30 974	4	129·1	18	807	5
NW Acid	272 577	10	36·6	57	293	6
Port Latta	510 993	14	27·4	169	464	11
Temco	313 185	Nil	....	....	....	....
Tioxide	860 067	11	12·8	141	229	13
Ceramic	413 636	41	99·1	241	815	6
All works	9 887 028	528	53·4	3 970	1 749	19
Collieries	91 071	6	65·9	82	1 261	14
Quarries	176 347	34	192·8	262	2 080	8
Total	18 491 029	2 002	108·3	43 439	2 998	13

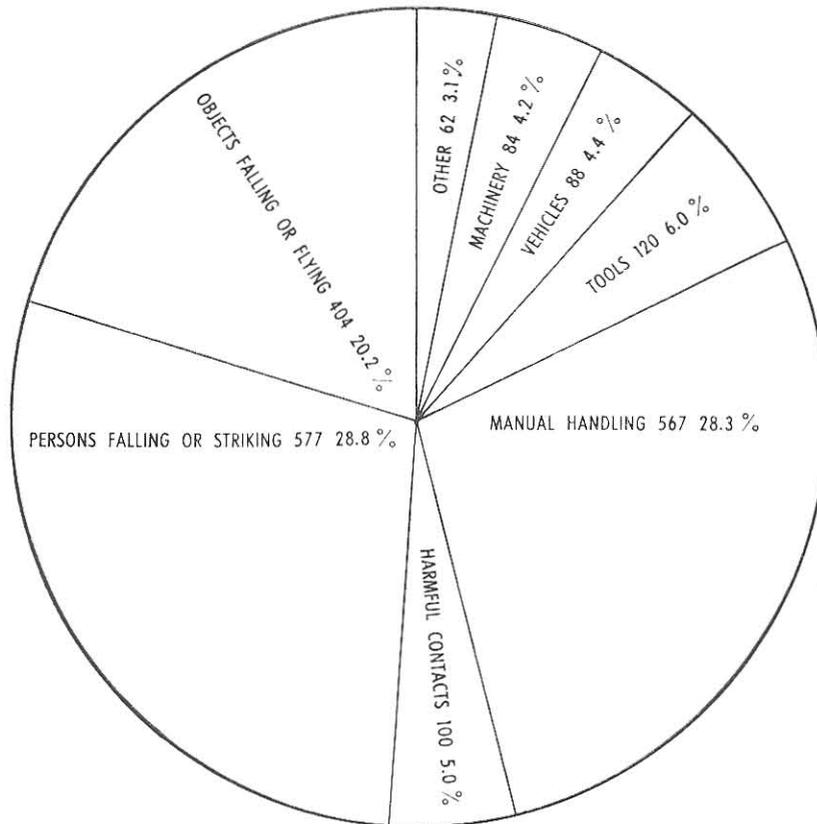
DESCRIPTION OF FATAL AND SERIOUS ACCIDENTS

Fatal

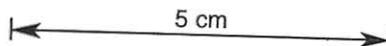
- K. L. Kay, Comalco: Crushed by aluminium billets during truck loading.
- M. J. Tuck, Comalco: Struck by flying block.
- C. W. Browning, Mount Lyell: Premature explosion in Alimak rise.
- M. F. Weller, Mount Lyell: Premature explosion in Alimak rise.
- R. K. Liversidge, Mount Lyell: Crushed between ore trucks.
- A. D. Lenane, EZ Co., Rosebery: Barring chute; struck on head by bar.

Serious

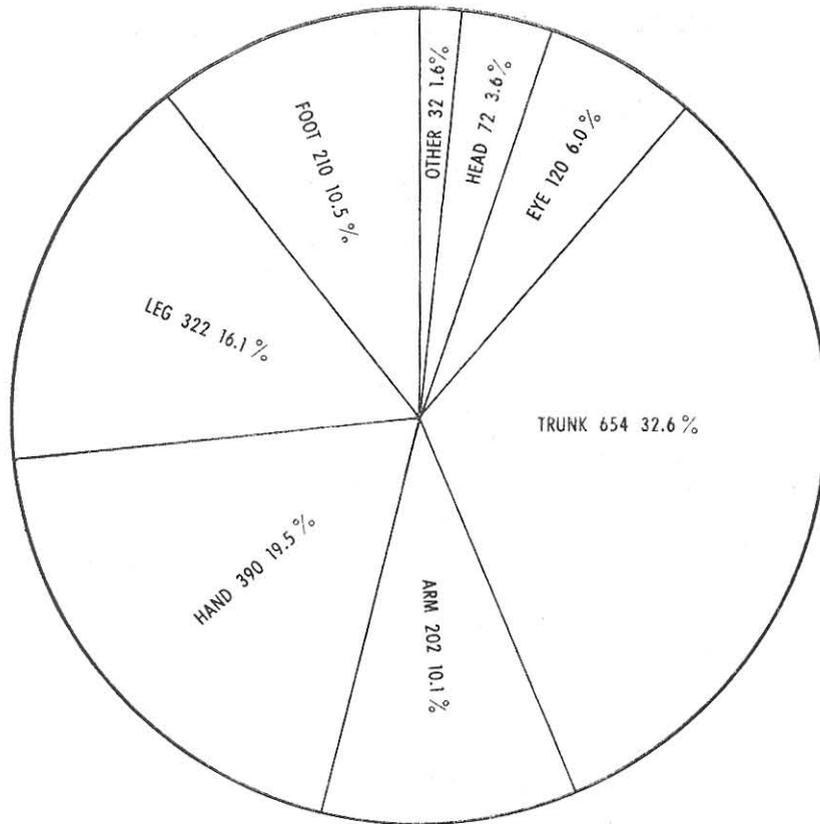
- L. W. Wills, Comalco: Fell from rod conveyor; broken back.
- J. Chaisty, Comalco: Fell from platform; broken leg.
- A. Fazackerley, EZ Co., Risdon: Hand caught in fan; lost thumb.
- G. E. Pratt, Aberfoyle: Circular saw cut off little finger.
- G. Lucas, Carbide: Sat in hot pot of carbide; burnt arms and legs.
- J. Dillon, Carbide: Crushed fingers; lost two tips following infection.
- B. F. Maine, Mount Lyell: Struck by fall of ground; lost two toes.
- A. G. Tyler, EZ Co., Rosebery: Hand caught in cement-fill feeder; lost two fingers.
- L. Kneebone, EZ Co., Rosebery: Crushed between bogger and truck; broken collar bone and pelvis, internal injuries.
- C. Blacklow, EZ Co., Rosebery: Caught by timber whilst riding a locomotive; broken pelvis and multiple injuries.
- J. T. Row, EZ Co., Rosebery: Machining timber; lost two fingers.
- J. Bujnowski, Savage River: Struck by drill steel guide bush; lost index finger.
- G. Wilson, Tioxide: Broke through asbestos-cement roof; multiple injuries.



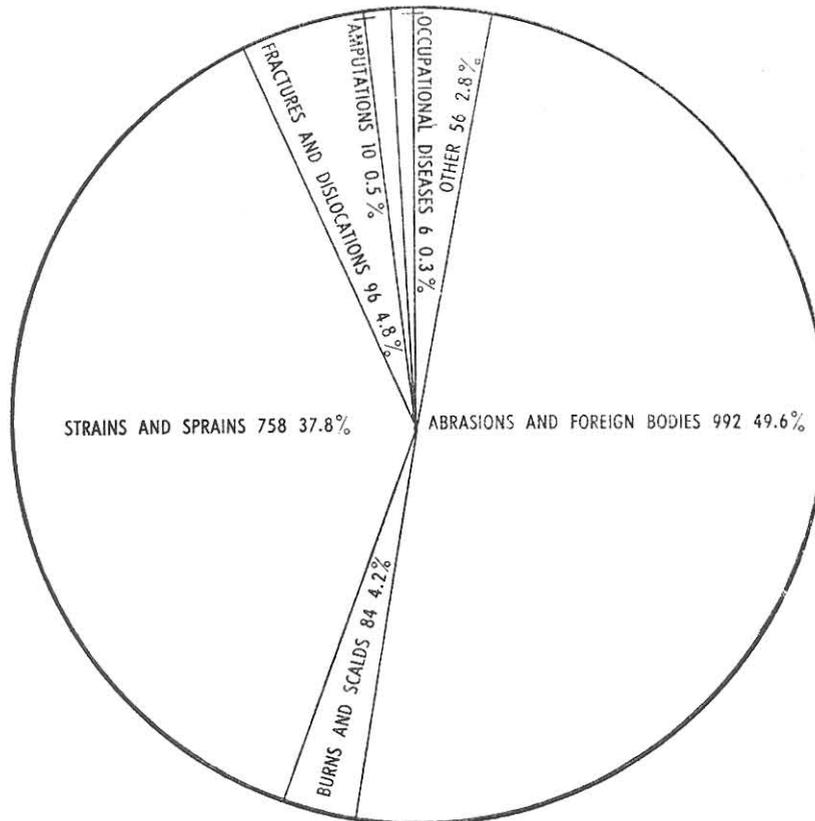
Accident Factor



66



Accidents : Location of Injury



Accidents : Nature of Injury

5 cm

DANGEROUS GOODS
The Explosives and Inflammable Liquids Acts
IMPORTS OF EXPLOSIVES

	<i>Hobart</i>	<i>Launceston</i>	<i>King Island</i>	<i>Burnie</i>	<i>Straban</i>	<i>Total</i>
Nitro-compounds (kg)	181 119	65 458	77 237	214 722	465 457	1 003 993
Detonators	202 550	439 950	29 000	288 000	1 001 000	1 960 500
Explosives shipments (No.)	3	3	3	4	4	14
Ammonium nitrate imported for use as an explosive (tonnes) ....	....	....	....	....	....	1 593

The number of licences and permits issued were: Magazine Licences, 178; Other Licences, 457; Shot Firer's Permits, 60.

IMPORTS OF INFLAMMABLE LIQUIDS

	<i>Bell Bay</i>	<i>Burnie</i>	<i>Devonport</i>	<i>Hobart</i>	<i>Total</i>
Inflammable liquids imported in bulk (tonnes)—					
Aviation gasoline	2 521	2 834	....	700	6 055
Kerosene—					
Aviation	5 260	....	305	11 164	16 729
Lighting	684	....	3 095	3 732	7 511
Power .. ....	....	....	....	2 000	2 000
Motor spirit—					
Premium	46 601	39 795	34 286	94 436	215 118
Regular	13 200	6 519	6 925	24 054	50 698
LP gas	1 231	....	....	1 290	2 521
Total	69 497	49 148	44 611	137 376	300 632
Tankships (No.)	19	10	10	20	59

Licences to keep, 2 186; Plans approved, 285; Exemptions granted, 16; Permits to import, 18.

Outrages

The police radio station at Queenstown was severely damaged by an explosion. The concrete building housing the radio equipment was later found to be unstable and complete demolition was considered necessary. With the exception of some burnt safety fuse, no explosives were found in the area.

The police station at Launceston was damaged by an explosion. Safety fuse had been used to detonate the charge.

Prosecution

A truck carrying explosives which was exceeding the speed limit was stopped by the police near Elizabeth Town; the driver received an on-the-spot penalty.

Accident

Unauthorised shot-firing was carried out in an attempt to construct a boat ramp at Granville Harbour. Fire holes were fired and a rock, about 10 cm in diameter, was hurled 85 metres to pass through the asbestos-board wall of a camp and hit one of the occupants.

MECHANICAL INSPECTION

W. S. Hodgson, M.I.E.Aust., Hobart

Plant inspections continued at all mines and works where extensive use is made of machinery.

Hoists

Following the brake failure of the Rosebery No. 2 shaft auxiliary winder, the braking system on all three winders is to be modified to improve safety.

A second head rope was changed on the skips and sent for destruction testing as part of a program to establish a maximum safe working life for these ropes. Present indications are that it will be 3.5 years on the skips and somewhat more on the cage.

The Prince Lyell shaft cage rope (51 mm diameter) developed a wave in the lay of the outer wires which ultimately resulted in one outer wire coming out of lock. The rope was changed on 20 July 1975. While Siemens technicians were adjusting the winder brakes, the counterweight got away driving the cage into the detaching bell and causing the rope to be broken after detachment. Fortunately there was no damage to the cage and only slight damage to the counterweight and headframe.

Vehicles

Owing to instances of brake failure in off-highway vehicles, contact has been made with the American Society of Automotive Engineers and other design and safety authorities with a view to a rationalising and improving brake operating and maintenance standards throughout the State.

Cranes

An accident involving a contractor's mobile crane at a mine has highlighted the need for closer scrutiny of these and steps have been taken to this end.

General

Certificates of competency were issued to seventy-three candidates examined.

A wide range of plant and equipment was examined for approval throughout the year.

DRILLING

J. B. Braithwaite, B.C.E., B.M.E., M.Aust.I.M.M., M.I.E.Aust.

DIAMOND DRILLING

The combination auger-diamond drill operated during most of the year. Four or five diamond drills operated throughout the year, two of these on a two-shift basis for part of the time. The high cost per shift for the auger-diamond drill was largely due to high diamond costs, most of the drilling being through hard unconsolidated ground.

Coal

One hole made a successful intersection of the coal and finished at 450 metres. The hole near the old Merrywood mine finished at 404 metres without encountering the coal and it would appear the area is faulted. Three more holes are being drilled.

Mineral Investigation

The hole at the Cambria mine was completed with some difficulty and a hole was started on Oliver Hill to continue the investigation of a geochemical anomaly. Drilling to test limestone reserves was carried out at Ralton and Mole Creek and one hole was drilled to test the quality of the quartzite at Glovers Bluff.

Foundation Testing

Much of this work was done for the Public Works Department although some was done for the Commonwealth Department of Works in conjunction with the Public Works Department. In addition to building and bridge foundations, work was done to assist in the estimation of excavation cost in road cuttings.

Stratigraphic Drilling

Both the auger and diamond drills were used to assist the departmental geologists in stratigraphic determinations and slip area investigations.

ROTARY DRILLING

Water Investigations

The Failing drill was employed in the Port Sorell area, both rotary and percussion systems being used. The drill crews carried out pump tests and assisted in logging the holes so that costs have no real relevance as far as actual drilling is concerned. The Mayhew 1000 drill was received in November and was employed in the Gladstone area.

CHURN DRILLING

Foundation Drilling

Two holes were drilled by the churn drill crew in the River Derwent off Bedlam Walls and in both cases diamond coring was undertaken when solid bottom was reached.

Water Investigation

Work was continued in the Scottsdale area and a number of spear bores were sunk and pump tested by one of the churn drill crews. The second churn drill was used for a short time and percussion drilling was used on some holes in hard rock.

DRILLING DETAILS

<i>Location</i>	<i>Purpose</i>	<i>Drill</i>	<i>No. of holes</i>	<i>Total depth (metres)</i>	<i>Auger only</i>
<i>Diamond—</i>					
Weldborough	Mineral investigation	F20C 1	1	35.56	
Rosny Hill	Road investigation	F20C 1	5	45.66	
Hobart (RHH)	Foundation investigation	F20C 1	1	15.96	
Harford	Stratigraphic investigation	F20C 1 & 2	1	273.11	
Railton	Limestone investigation	F20C 1 & 2	8	462.08	
Mole Creek	Limestone investigation	F20C 1	5	182.54	
Oliver Hill	Mineral investigation	F20C 1	1	8.77	
Fingal ..	Coal investigation	12 B	2	505.67	
Hobart ..	Foundation investigation	12 B	4	39.61	
Cygnat ..	Stratigraphic investigation	12 B	....	Nil	
Fingal ..	Coal investigation	Edeco	1	455.00	
Royal George ..	Coal investigation	30 HD	1	404.00	
Fingal ..	Coal investigation	30 HD	1	363.20	
Geeveston	Quartzite investigation	E 1000	1	94.14	
			—	—	
			30	2 885.30	
			—	—	
<i>Diamond/Auger—</i>					
Railton ..	Limestone investigation		13	245.85	190.64
Launceston ..	Foundation investigation		1	18.00	18.00
Cambridge ..	Foundation investigation		3	43.31	43.31
Railton ..	Limestone investigation		4	118.94	54.16
Launceston ..	Foundation investigation		6	126.18	80.26
Mowbray	Foundation investigation		1	18.59	18.59
Kingston	Slip Investigation		4	52.52	2.34
Ulverstone ..	Foundation investigation		12	127.80	86.43
Freshwater Point	Stratigraphic investigation		1	7.34	....
Melton Mowbray	Cutting investigation		5	57.38	....
Launceston ..	Foundation investigation		3	33.41	....
			—	—	—
			53	849.32	493.73
			—	—	—

<i>Location</i>	<i>Purpose</i>	<i>Drill</i>	<i>No. of holes</i>	<i>Total depth (metres)</i>	<i>Auger only</i>
<i>Churn—</i>					
Gladstone	Water investigation	K55-2	8	232.37	
River Derwent	Bridge foundation	K55-1	2	94.69	
Waterhouse	Water investigation	K55-1	14	260.45	
			24	588.31	
<i>Rotary/Percussion—</i>					
Scottsdale	Water investigation	WW1	1	60.93	
Port Sorell	Water investigation	WW1	13	485.83	
Gladstone	Water investigation	Mayhew 1000	2	100.07	
			16	646.83	

SUMMARY OF DRILLING

<i>Drill type</i>	<i>No. of drills operating</i>	<i>Metres drilled</i>	<i>Total cost (\$)</i>	<i>Cost per metre (\$)</i>	<i>Cost per shift (\$)</i>
Diamond	5	2 885.30	106 040.77	36.75	85.31
Diamond/Auger	1	849.32	21 115.11	24.86	109.40
Churn	2	588.31	25 279.24	42.49	88.70
Rotary/Percussion	2	646.83	21 135.06	32.67	91.09
	10	4 969.76	173 570.18	34.93	88.87

NORTH-WESTERN DISTRICT

H. Murchie, B.Sc., D.R.T..C., M.Aust.I.M.M.

E. C. Leyland, A.W.A.S.M., A.M.Aust.I.M.M.

P. Allan, B.Sc., A.H.-W.C., A.M.I.M.M., Burnie

GROUND MOVEMENTS

In April, more than 100 tonnes of rock fell from The Nut at Stanley. No damage to installations or personnel resulted on this occasion. As far as was practicable the face was inspected, and possible future trouble areas indicated to the appropriate authorities.

At Lynchford, near Queenstown, more than 1 000 tonnes of rock and detritus slipped from the face of an old quarry site and blocked the road. The council supervisor was advised to implement a new method of extracting spoil in order to prevent a similar occurrence. No physical injury to members of the public resulted from this slide.

Following an allegation that a large concrete water tank had been destroyed by explosives at Marrawah the police requested assistance. There was no visible evidence of explosives and it was considered that the failure was caused by ground movement in association with hydraulic pressure.

EXPLORATION

Mt Lyell Mining and Railway Co. Ltd

E.L. 10/69. Work was conducted in three main areas. Geological mapping of the core of Cambrian acid lavas and agglomerates, overlain by Tyndall Group rocks and Owen Conglomerate was carried out on the eastern slopes of Mount Lyell.

Geological mapping and ground magnetic surveys on the Little Owen grid carried out between Whip Spur and the Lyell Highway suggest that many of the anomalous IP responses are related to mineralisation on the contact of intrusive intermediate bodies. The IP coverage was extended northwards using a Schlumberger array.

Geological mapping and stream sediment sampling was commenced over the Cambrian volcanic rocks on Mt Sedgwick.

E.L. 41/71. Work continued on the West Sedgwick grid, south of the Lake Margaret township, with soil sampling of areas by IP anomalies. The grid was extended to the north and south-west in preparation for an extension of the geophysical coverage. Another grid of 45 line-kilometres comprising 17 lines spaced at 200-metre intervals was established north of Basin Lake and surveyed using gradient array IP. Several extensive anomalous zones were indicated. A smaller grid consisting of 7 lines totalling 8 line-kilometres was established over the Madame Howard area and surveyed using gradient array IP.

E.L. 9/66. Evaluation of the IP anomalies in the Henty Fault Zone continued with costeaming and the completion of three diamond drill holes, for a total advance of 580 metres. Several of the IP anomalies were detailed with pole-dipole IP and the zone of high changeability response between lines 54N and 61N re-surveyed with Turam. A limited amount of geochemical soil sampling was undertaken in the vicinity of the geophysical anomalies and adjacent to the Henty Fault.

Following a re-interpretation of the McPhar IP data to the south of the Henty camp, two small grids with a line spacing of about 200 metres, totalling 9 150 metres and 1 200 metres line length, were pegged over Zone A, and Howard's Anomaly respectively. These grids were surveyed with ground magnetics, gradient array IP and re-mapped in detail. Several of the anomalies were checked with geochemical soil sampling and at the end of the year preparations were in hand to commence a six-hole diamond program.

S.P.L. 129. A detailed evaluation of all previous work in the area was conducted and included some re-mapping and sampling. Subsequently two zones were considered to warrant further work: the Tenth Legion area and Area D, east of Kelvin and Mayne's workings.

Sampling in the Tenth Legion area indicated that some tin mineralisation may be associated with the magnetic deposit. Four grid lines were established over the geochemical tin anomaly on Area D and the soil anomaly confirmed by a program of deep soil sampling. At the end of the year preparations were in hand to cover the zone with an IP array and to extend the soil sampling to the south.

S.P.L. 138. This area was pegged on 17 June 1974 over the Nelson Valley-Bubbs Hill-Cardigan Flats area in order to investigate lead-zinc mineralisation in the Gordon Limestone. Geological mapping, stream sediment and soil sampling indicated that the main area of potential interest was a gossanous zone, immediately south of the Lyell Highway, in the Cardigan Flats area. As this area lies within a scenic reserve,, adjacent to the Lyell Highway and in light of the considered limited potential of the remainder of the licence area for significant lead-zinc sulphide deposits, the licence was relinquished.

Electrolytic Zinc Co. of Australasia Ltd

E.L. 1/62. Exploration activity continued on the Primrose pyroclastic formation both north and south of Rosebery. Favourable areas as defined by sedimentary horizons, geophysical or geochemical anomalies or combinations of these were evaluated by diamond drilling at West Hercules, South Hercules, North Hercules, Jupiter and Koonya.

The promising West Hercules prospect was tested with two diamond drill holes during the year. Further diamond drilling of the Hercules host rocks was completed with holes testing a strike length of 750 metres south of the mineralisation located and tested in 1973. Two diamond drill holes tested geophysical and geochemical targets in the Burn's Adit-Ring PA area without intersecting any economic mineralisation.

The soil sampling program was extended north from Jupiter to the Salisbury mine area. Although low order geochemical and geophysical anomalies were located they have not yet been tested with diamond drilling. The Jupiter copper and lead zinc prospects were tested with three diamond drill holes. The Koonya-Grand Centre mineralisation was tested by 1 152 metres of diamond drilling over a strike length of 400 metres. A single diamond drill hole tested the Rosebery host rocks east of the Grand Centre workings. Further testing of this area is planned.

At the end of the year, a single diamond drill hole north of the Rosebery mine was in progress to test for the Rosebery host rock horizon 500 metres north of previous drilling. Surface geochemical and geophysical surveys were conducted over the area north from Rosebery mine to the Pieman River and in the South Dalwitz area. All field work was completed for the photogrammetric production of accurate topographic plans at a scale of 1 : 5 000 of the western half of the licence area. Bad weather conditions have hampered the necessary aerial photography which was still not available at the end of the year. Trials were undertaken to test the application of the magnetic induced polarisation system and of the mercury soil sampling technique to the exploration for Rosebery type orebodies.

S.P.L. 132. A special prospector's licence covering the Mt Dundas mineral field and the continuation of the Primrose pyroclastic rocks south of E.L. 1/62 was applied for and granted during the year.

The area covering the Mt Dundas mineral field, was relinquished after the data collected by the previous holders, Texins Development Pty Ltd, had been examined.

The reduced area of S.P.L. 132 covering the Primrose pyroclastic rocks has been previously explored by Rio Tinto Australia Exploration Ltd in 1958-61. A single gradient array induced polarisation spread was completed over the anomalies located.

S.P.L. 3. The Farrell mine remained on a care and maintenance basis during the year and consequently exploration activity remained at a low ebb. Activity by the HEC in the area north of the Farrell mine has created many new exposures of bedrock. The area north of the Farrell mine will be mapped during the summer of 1974-75.

E.L. 12/72. A 9 km² extension was granted to this licence, at Bulgobac during the year. The irregular shape of this licence remains a problem when the application of systematic surface geochemistry or geophysics is considered. Geological mapping of the existing access tracks continued.

E.L. 13/65. At the end of 1974, agreement was reached with BHP and International Nickel Pty Ltd for joint venture exploration of the Jukes-Darwin area.

SOUTHERN DISTRICT

J. B. Braithwaite, B.C.E., B.M.E., M.Aust.I.M.M., M.I.E.Aust.

R. C. Thomas, A.C.S.M., A.M.I.M.M., M.Aust.I.M.M., Hobart

Assistance and technical advice were given to other departments, contractors and shotfirers in connection with blasting operations in the Hobart area. Complaints from the public regarding nuisances from blasting operations were dealt with and where necessary modifications to procedures were introduced to minimise the nuisances.

During the year officers of the Department assisted in a survey of the Giblin Street quarrying operations of Hobart Quarries for an environmental impact study group set up under the auspices of the Department of the Environment.

A contract was awarded to Pearson Bridge Pty Ltd to drive the tail-race tunnel for the Hydro-Electric Commission at Strathgordon. At the end of the year a start had been made on the establishment of a tunnel portal.

EXPLORATION

Warman International Ltd

Five exploration licences were relinquished, E.Ls. 8/73, 5/69, 17/72, 18/72 and 20/73 in which 991 metres of auger drilling for geological and geochemical information on seven prospects and 210 metres of percussion drilling were completed.

E.L. 13/73 in the south of King Island was consolidated with E.L. 15/66, the main exploration licence, which was reduced in size to cover 112 km² in the south-east of the island. Exploration licences held at the end of the year were E.Ls. 15/66 and 23/69. Within the exploration licences retained, 1 488 metres of auger drilling were completed on three prospects, mainly around the Grassy granite contact zone where 745 metres of diamond drilling on four prospects were completed. One prospect in this zone was tested by 76 metres of percussion drilling.

E.Ls. 9/69, 14/72. A Gemco drill is in full-time use for exploration drilling. The indicated deposits at Cowper Point are being drilled on a close grid to prove reserves. Scintillometer surveys followed by scout drilling have been carried out in other areas of the exploration licences.

Report of the Mount Cameron Water Race Board for the year ended 31 December 1974

THE MINISTER FOR MINES

We submit the Report of the Mount Cameron Water Race Board for the year ended 31 December 1974.

The Board continues to be concerned at the growing loss on the operation of the race. There is only one user of water for mining purposes and although productive activities were more constant with a consequent increase in revenue, this was more than offset by higher operational costs, particularly necessary increases in wages. Essential repairs are also required to the Cybele syphon where a double line of aluminium piping 18 metres in length will be fabricated and installed at a cost of \$500. Other maintenance was carried out by the Board's staff and the race is in good order.

The loss for the year increased from \$9 276 to \$13 204 because of higher wages and purchase of materials for maintenance.

There has been no development of potential tin deposits or the growth of irrigation schemes which can be supplied from the race and unless these possible sources of revenue are realised the operational loss must continue to grow.

J. G. SYMONS, Chairman

H. K. TURNER, Member

V. WOOD, Member

MOUNT CAMERON WATER RACE SUSPENSE ACCOUNT

STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31 DECEMBER 1974

<i>Receipts</i>	\$	<i>Payments</i>	\$
Sale of water—		Salaries and wages, including pay-roll tax	14 667·08
Fixed on cash sale	2 697·30	Insurance	546·98
Royalty scale .....	....	Car allowance	150·00
Domestic use .....	....	Maintenance materials	508·67
Balance (loss)	13 204·41	Miscellaneous	28·98
	\$15 901·71		\$15 901·71

MOUNT CAMERON WATER RACE

STATISTICS FOR YEAR ENDED 31 DECEMBER 1974

<i>Registered Rainfall</i>		<i>Production</i>	<i>Tonnes</i>
Great Musselroe	1 866 mm	Tin oxide produced—	
Little Musselroe	1 490 mm	Fixed scale	14·072
		Royalty scale .....	....
<i>Water Services</i>		<i>Employment</i>	
Average number of claims supplied per week	1	Average per week—	
Greatest number of claims supplied in any one week	2	Fixed scale	4
Sluiceways supplied—		Royalty scale .....	....
Fixed scale	765		—
Royalty scale .....	....		4
	765		—

Report of the Ringarooma and Cascade Water Board for the year ended 31 December 1974

THE MINISTER FOR MINES

We submit the report of the Ringarooma and Cascade Water Board for the year ended 31 December 1974.

There were no developments in proposals for re-opening the Briseis tin mine at Derby or for an irrigation scheme for the Winnaleah district based on the Cascade dam. The Cascade dam is in good order and is being kept full of water but the Mount Paris dam has been emptied.

The loss of \$1 212·34 consists of interest on the capital cost of the water system and caretaking charges on the Cascade dam.

J. G. SYMONS, Chairman

H. K. TURNER, Member

N. P. EDWARDS, Member

RINGAROOMA AND CASCADE (WATER) SUSPENSE ACCOUNT STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31 DECEMBER 1974

	<i>Receipts</i>	\$		<i>Payments</i>	\$
Balance (loss)		1 212·34		Interest on capital cost	1 062·34
				Caretaking	150·00
		\$1 212·34			\$1 212·34