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# Mineral Resources Tasmania



## Annual Review 1994/95



TASMANIA  
DEVELOPMENT  
AND RESOURCES

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# Mineral Resources Tasmania

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*Annual Review*  
**1994/95**

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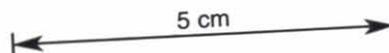
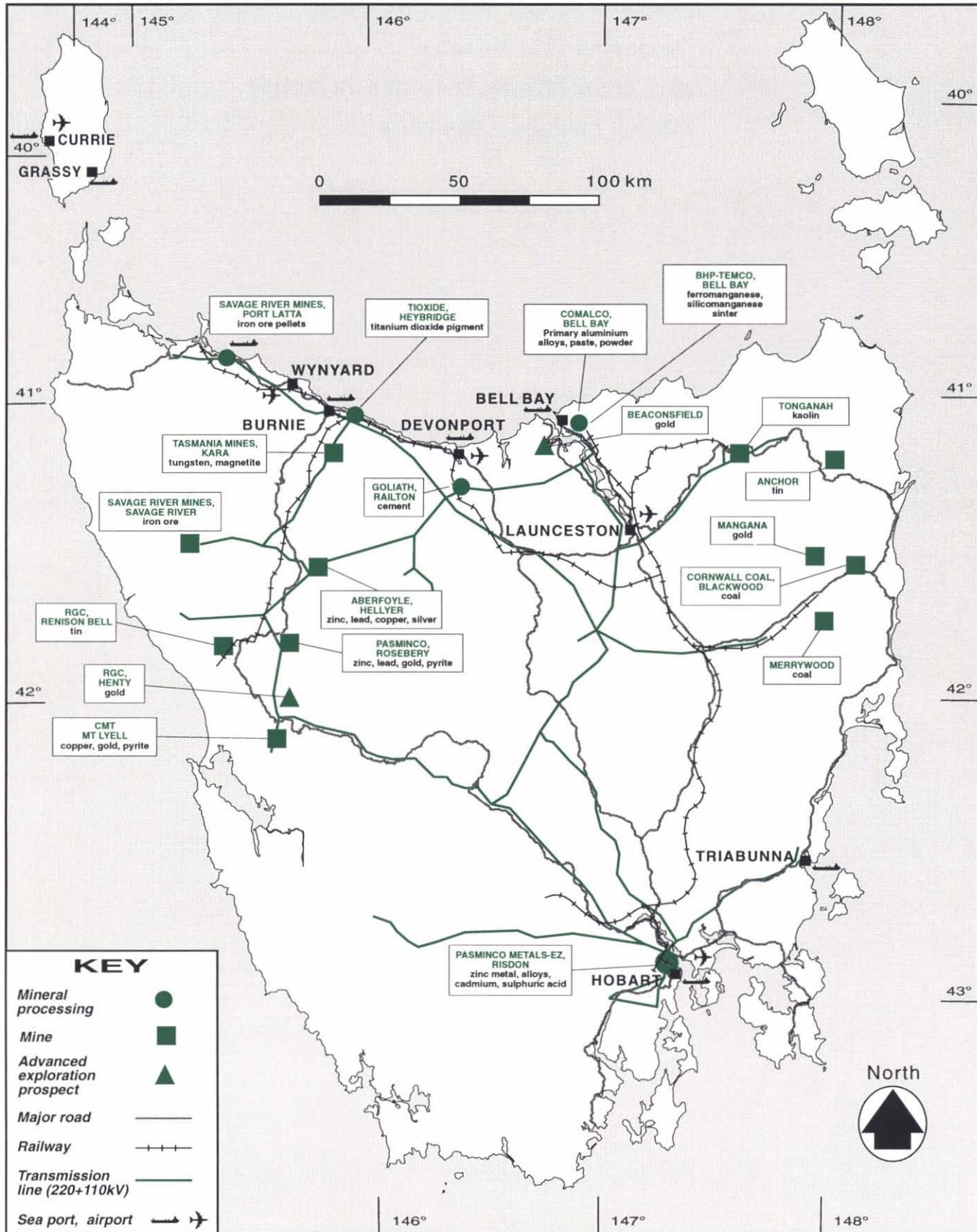
*INDUSTRY SAFETY AND MINES*

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# Tasmania

## Major Mining and Mineral Processing Operations



# Mineral Sector Overview

In its 1993/94 Annual Review, Mineral Resources Tasmania predicted that year would later be seen as a watershed for the Tasmanian mineral sector. The experience of 1994/95 has proven that prediction correct, to the benefit of the Tasmanian community.

Mineral exploration expenditure, quarter by quarter, has continued to climb out of the trough established in the early 1990s, with spending in each of the last nine quarters increasing over the respective previous quarter, a performance equalled only by Western Australia. Expenditure by mining company exploration teams in their quest to discover new mineral deposits in Tasmania totalled \$14.9 million during 1994/95, the highest expenditure this decade. Performance indicators covering exploration licence applications, metres drilled and areas held under licence all show healthy increases from the low levels of expenditure in the early 1990s. Tasmania's share of the nationwide expenditure on exploration also improved.

The Tasmanian Government is strongly supportive of the mining and mineral processing sector and is aware of the need to maintain access to prospective ground for mineral exploration, with protection against sovereign risk. The Strategic Prospectivity Zones (SPZ) legislation, enacted in 1992, continues to demonstrate 'best practice' in mineral tenement administration and provides the encouragement and assurance needed to bring exploration capital to Tasmania. 'Sustainability' of the State's mining industry, within the boundaries of such a definition for an ultimately finite resource, depends on the discovery of new deposits and the extension of known resources, by further exploration of existing fields. With the mineral sector accounting for more than 40% of Tasmania's generation of wealth through exports, it is of paramount importance that this sector is encouraged to expand and grow.

In addition to enacting supportive legislation, the Tasmanian Government is committed to providing up-to-date geoscientific data, in state-of-the-art digital formats, to assist explorers in mineral target identification. This effort, which is based on the mapping and data acquisition activities of the Geological Survey Section of Mineral Resources Tasmania, focuses on sparsely-explored regions of the State. The Division's intentions are to increase the area of Tasmania of interest to mineral explorers by stimulation with pre-competitive geological data packages. Competition for the exploration dollar is intense, both between the Australian States and internationally. Tasmania's commitment to the task of increasing its market share will continue. Following the success of the Mount Read Volcanics Project and the NETGOLD initiative, new programs will be designed to stimulate explorer interest in the extensive area extending from the southeast, through the Midlands to the northern shores of Tasmania. As with government sponsorship of remote-sensing data acquisition programs in South Australia, Victoria and New South Wales, this commitment provides 'seed corn' for the mines of the next century and is indicative of far-sighted Government.

From an exploration activity perspective, the return of CRA Exploration Pty Ltd to Tasmania, focusing on the State's potential for discovery of world-scale copper/gold, nickel and base-metal deposits, is a welcome sign of continuing buoyant interest. The activities of the predominantly Western Australia-based gold explorers in the NETGOLD area of the State's northeast, coupled with intense activity in the Tyndall Group rocks of the Mount Read Volcanics in the Henty Gold discovery area, provide confidence that Tasmania will shortly gain recognition as a gold province.

The commitment of Gold Mines of Australia Ltd, through its subsidiary Copper Mines of Tasmania Pty Ltd, to continue mining the Prince Lyell and Western Tharsis deposits in the Mount Lyell field, has provided great encouragement to the West Coast. The projected production rate of 3.5 million tonnes per annum and the likelihood of local value-adding to copper metal on site will see a return to the greatness of the early days of this century-old mining field. With the copper price currently holding at US\$3000/tonne, the investors in this project should be amply rewarded.

RGC (Tasmania) Ltd is on target to bring the Henty Gold mine into production, as scheduled, in July 1996. This small, high-grade mine will demonstrate to the community how today's mining industry can operate in ecologically sensitive areas with little or no long-term disturbance of the environment.

At the Renison Tin mine, Renison Limited has commenced stripping of the shaft designed to effectively exploit deeper reserves outlined in the Rendeep drilling program. This \$35 million commitment will also assist in increasing production rates and lowering tin metal production cost.

Pasminco Australia Limited, in addition to its significant exploration commitment, is proceeding with a \$44 million, four-year program to delineate and develop deep ore resources identified by drilling at the Rosebery mine.

At Hellyer, continuing efforts by Aberfoyle Resources Limited are targeted at finding new reserves to sustain Tasmania's newest major mine after its present reserves are exhausted early next century. Research continues into the feasibility of extracting gold and other minerals contained in tailings.

During the year, Cleveland Cliffs Limited, the owners of the Savage River mine, announced that they would not be proceeding with the development of a major underground block caving operation in the Northern Deposit at Savage River. With mining expected to cease in 1996, Tasmania Development and Resources has put significant effort into locating an investor willing to develop this potentially billion-tonne resource.

At Beaconsfield, the joint venture of Allstate Exploration NL, Beaconsfield Operations Pty Ltd and Golden Shamrock Mines Ltd has been successful in defining a major gold reserve and is proceeding to dewater this old mine. A new pump station has been established at the 180 metre level, with dewatering rates now approaching 700 litres/second. The management is to be congratulated for the technical competence and dedication to the task, but also for gaining the respect and support of the community in which the mine is centred.

A disappointment to all was the failure of the Riltec (Tas) Pty Ltd gold-from-tailings extraction plant at the Golden Gate mine site at Mathinna, in the northeast. Technical problems could not be solved before the company's operating capital was exhausted. This resulted in the need for this agency, and the Department of Environment and Land Management, to combine in an exercise to detoxify the tailings dam water and residues. The company is now in the hands of a receiver. Despite this setback, Mineral Resources Tasmania will continue to encourage 'small mining' activity.

In this regard, and on the credit side, Mancala Pty Ltd has successfully reopened the small Anchor Tin mine at Lottah. A current tin price high of over US\$7000 per tonne should reward both Renison and Mancala for their persistence, and encourage other companies to investigate Tasmania's potential for both tin and tungsten.

The coal mining industry in Tasmania continues to be dominated by the Cornwall Coal Company No Liability, owned by Goliath Portland Cement Company Ltd, and the Merrywood Coal Company Pty Ltd. Fierce competition for the local coal market between these two companies has resulted in the restructuring of Cornwall Coal and the closure of the Duncan Colliery. Merrywood has increased production from its open-cut mine near Royal George and remains optimistic of opening a new open-cut operation, the Kimbolton mine near Hamilton in the State's southeast. This development, if it proceeds, will be a joint venture between the lease holder, Capricorn Mining Ltd, and the Merrywood Coal Company Pty Ltd. The State's coal industry retains the capacity to provide an economic thermal contribution to the State's electricity grid from a combination of mined coal and the Cornwall coal residues stockpile at Fingal. This latter source of cheap thermal energy should not be forgotten in the debate over Tasmania's next step forward in energy requirements.

Consolidation of the vitally important value-adding mineral processing operations appears to have been the order of the past year. Pasminco Metals-EZ continued to work on improving the efficiency and workplace culture at their Risdon zinc smelter, and moved towards being truly world competitive.

The Comalco aluminium smelter at Bell Bay, through innovative management and targeted capital expenditure, has re-established itself as a contender for capital expenditure on redevelopment and expansion. Of note has been the improvement in workplace culture and the dramatic reduction in workplace injuries. The buoyancy of the aluminium market has also provided confidence to this important Tasmanian facility.

The Temco ferro-alloy smelter is considering the possibility of adding a fourth furnace. The prospect of utilising the slag from this process in lightweight construction products and, finely ground, as a supplement to Portland cement, is excellent news in the continuing struggle for sustainable production systems.

The success of the conversion of the Heybridge plant of Tioxide Australia Pty Ltd to a high titanium slag feed appears to have secured the immediate future of this plant and, importantly, the chance of expansion in the future. The virtual disappearance of the 'red sea' is a visual indicator of success.

The Goliath Portland Cement Company Ltd has successfully established its expanded plant at Railton and the State can look forward to the possibility of further increases in scale of this cement producer.

From a divisional point of view, the year saw the establishment of Industry Safety and Mines (ISM) following the merger of Mineral Resources Tasmania and the Industry Services Division of Tasmania Development and Resources. The new Division has responsibility for the mineral sector, including tenement management and geoscientific data acquisition, and for workplace safety and workers rehabilitation and compensation in all workplaces in the State. Tasmanian mines and general industry now operate under one piece of occupational health and safety legislation — the *Workplace Health and Safety Act 1995*.

The structure of Industry Safety and Mines, within Tasmania Development and Resources, is shown on Page 19.

The Division has dedicated itself to updating its legislative base, and 1994/95 saw:—

- The passing of the *Workplace Health and Safety Act 1995* and the *Workers Rehabilitation and Compensation Reform Act 1995*.
- The final preparation of the *Mineral Resources Development Bill 1995* for introduction to Parliament in the 1995 Budget Session.

New royalty arrangements have been discussed with industry and the resulting regulations have been drafted. These changes will undergo the subordinate legislation review process early in 1995/96.

A start was also made on the Workplace Safety Regulations and Mining Regulations. It is anticipated that this thorough updating of the Division's legislative base will be completed by the end of 1995. Industry Safety and Mines staff deserve congratulations for the hard work and determination to complete these significant reforms.

The third edition of the *Mineral Exploration Code of Practice* was released during the year. The Code outlines the environmental standards for exploration procedures in Tasmania, and has received widespread support.

The *Quarry Code of Practice*, a joint publication with the Department of Environment and Land Management, was released in February 1995 following extensive consultation with Government agencies, industry organisations, and the community. The Code will assist Councils in administering planning

applications and managing the environmental effects of quarrying, and provides advice for operators of small-scale pits. Subjects covered by the Code include legislation, site selection and planning, safety, environmental management, drainage, erosion and rehabilitation. Site planning is particularly important and can minimise the environmental impacts and complaints. The Code incorporates bottom-line environmental standards to provide for a uniform minimum standard of operation across the industry, and suggests measures for operators to improve their environmental performance above these minimum requirements.

The mineral industry continues to improve its safety performance. The lost time injury frequency rate shows a continuing fall, from 33 last year to 27 in 1994/95, an improvement of 15%. Hard work by all companies will be needed to maintain this improvement, as the figures show continuing gains by some companies, notably Comalco, and a deteriorating performance by others, notably Pasmaenco Metals-EZ at Risdon.

The mission of Industry Safety and Mines for the coming year will be:-

- To achieve sustainable and environmentally responsible development of the State's mineral sector and provide for geoscientific understanding in support of effective land management.
- To increase the productivity and competitiveness of Tasmanian industry by promoting a culture of safety in all workplaces and to minimise the social and economic costs of workplace injury and illness.

To achieve this mission, the focus for the coming year will be on:-

- Growth of exploration activity by a further 20%;
- Promotion of our mineral potential both interstate and overseas;
- A return of the Geological Survey to mapping in areas of potential interest to explorers;
- Liaising with Department of Environment and Land Management to further improve environmental performance;
- Gaining community and industry support for a major data acquisition exercise targeted at the potential mineral wealth in the Midlands;
- Developing linkages with all sectors, including workers and employers, through consultative forums;
- Reducing workplace injury rates in the mineral sector further, and spreading the development of excellent safe work practices to general industry in Tasmania;
- Establishing Industry Safety and Mines as a Division that can lead by example in all areas of its responsibilities.

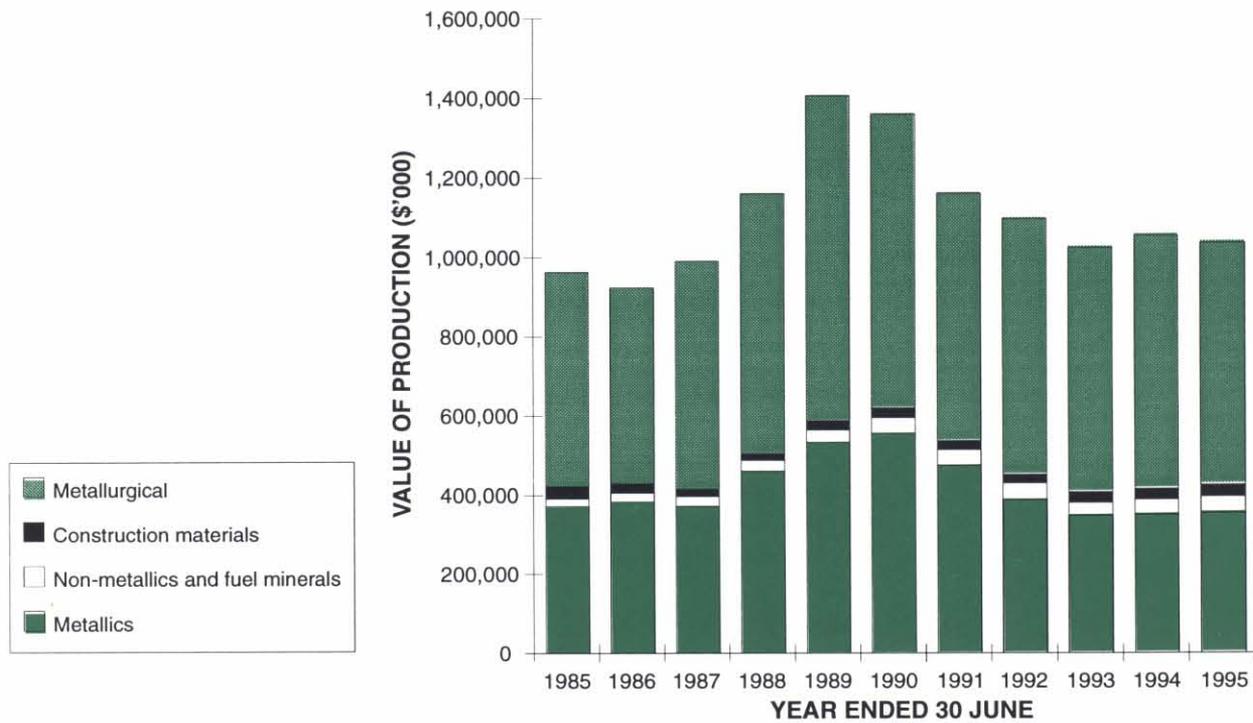
## **MINERAL PRODUCTION**

The 1994/95 financial year saw an easing in the World oversupply of aluminium, tin, zinc and lead and a corresponding steady firming of prices. Copper and gold have generally held a price satisfactory to Australian producers.

The steady improvement in the tin price and the indications of a change in China's domination of the tungsten market gives hope for a resurgence of interest in Tasmania for discovery and mining of these, at times, rewarding metals. Investors should note that many areas highly prospective for these commodities remain as open ground for exploration. Some counter-cyclical interest by companies with vision for the future may well pay dividends.

## Value and production of minerals 1993/94 and 1994/95

	1993/94		1994/95		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Gold	1.35	-	1.35	-	0
Silver	140	-	146	-	+4.3
Zinc	165 934	-	177 263	-	+6.8
Copper	32 822	-	33 281	-	+1.4
Lead	71 752	-	54 453	-	-24.1
Tin	7 415	-	7 416	-	0
Tungsten	26	-	39	-	+50
Iron ore pellets	1 565 882	-	1 483 830	-	-5.3
Others	199 922	-	136 603	-	-31.7
Total metallic minerals	-	350 741	-	355 211	+12.7
Non-metallics and fuel minerals	-	38 732	-	40 664	+5.0
Construction materials	-	27 088	-	28 617	+5.6
Metallurgical production from imported ores	-	639 023	-	609 664	-4.6
Value of mining and mineral processing sectors	-	<b>1 055 584</b>	-	<b>1 034 157</b>	-2.1



The Mount Lyell Mining and Railway Company Limited ceased production in December 1994 after 101 years of continuous operation. The mineral leases were subsequently transferred to Copper Mines of Tasmania Pty Ltd (a subsidiary of Gold Mines of Australia Ltd), with GMA purchasing all mining equipment and infrastructure from the Mt Lyell Mining and Railway Company. It is anticipated that production will recommence by the end of the 1995 calendar year.

Iron ore pellets and coal washery-grade magnetite were in strong demand by both the Australian and Asian markets. Savage River Mines completed a feasibility study into an underground production option but decided that this would involve too high an economic risk. The company will deplete the remaining open-cut reserve and cease all operations by March 1997. A Government taskforce has been formed to actively pursue a buyer for the substantial remaining resource and the infrastructure. Tasmania Mines Limited has established a facility for the production of coal washery-grade magnetite.

A higher tonnage of ore was milled at the Renison Tin mine than in the previous year but because of a lower headgrade and poorer metal recovery, less tin in concentrates was realised. Because of the low tin price the Company operated at a loss for the first half of the year, but a substantial improvement in the tin price was realised during the second half of the year. Good progress was made with the mining of an internal shaft, crusher station and ancillary development to exploit the deeper orebodies.

Spectrum Resources Australia Pty Ltd recommissioned the Anchor mine treatment plant, with a tin concentrate shipment being made just before year-end. Sources of ore were old tailings and stockpiles. Preparations for underground ore production are proceeding.

Total coal sales increased slightly over the previous year. The Cornwall Coal Company No Liability recorded a 15% decrease in sales while the Merrywood Coal Company Pty Ltd increased sales by nearly 95%. A bulk coal sample, collected from the Kimbolton Coal Joint Venture lease at Langloh near Hamilton, was washed at Merrywood and trialled at Australian Newsprint Mills' Boyer plant.

The base metal operations in the State benefited from increased average commodity prices. An environmental management plan was prepared by Pasminco Metals-EZ for a proposed treatment circuit change to incorporate the production of paragoethite. This will effectively eliminate the need for ocean dumping of jarosite.

The level of gold production was adversely affected by the cessation of the Mt Lyell Mining and Railway Co Ltd operations and a comparatively low gold headgrade at Pasminco Mining's Rosebery mine. Work towards gaining access to the gold-bearing horizons at the Beaconsfield Joint Venture mine and the RGC (Tasmania) Ltd Henty Gold Project continued.

## **FINANCIAL PERFORMANCE**

In accordance with the *Financial Management and Audit Act 1990* the Department is required to report on the year's financial transactions against the original appropriation. Detailed records are published in the Tasmania Development and Resources annual report to Parliament.

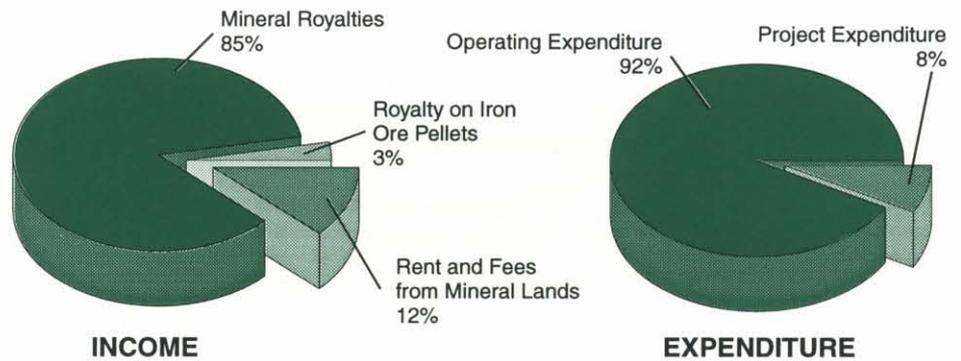
During 1994/95 Mineral Resources Tasmania and the Industry Services Division were restructured to form the Division of Industry Safety and Mines. This necessitated the redevelopment of the 1994/95 budget. Although some corporate service functions were returned to the new Division, for comparative purposes only the direct operating costs of the former Mineral Resources Tasmania are reported.

Of a total TDR Consolidated Fund Budget of \$35.54 million, the Mineral Resources Branch of Industry Safety and Mines was allocated \$4.2 million.

In 1994/95 revenue amounted to \$9.5 million compared to \$4.8 million in 1993/94. The increase in revenue of \$4.7 million was mainly due to the recovery of metal prices and the resultant high royalty payments, particularly in respect of copper production.

In 1995/96 direct operating costs will be reduced by approximately \$450,000 to \$3.75 million. This reduction is wholly attributed to a reduction in funding for supporting programs funded through the Assistance to Industry program. Revenue for the same period is estimated at \$5.9 million, a surplus of revenue over direct expenditure of \$2.25 million.

*Estimated Financial Position, 1995/96*



## VALUE OF THE MINING INDUSTRY

As well as the direct contribution to the Tasmanian economy through employment, the mining and mineral processing industries also contribute through taxes and charges paid to State and Local Governments.

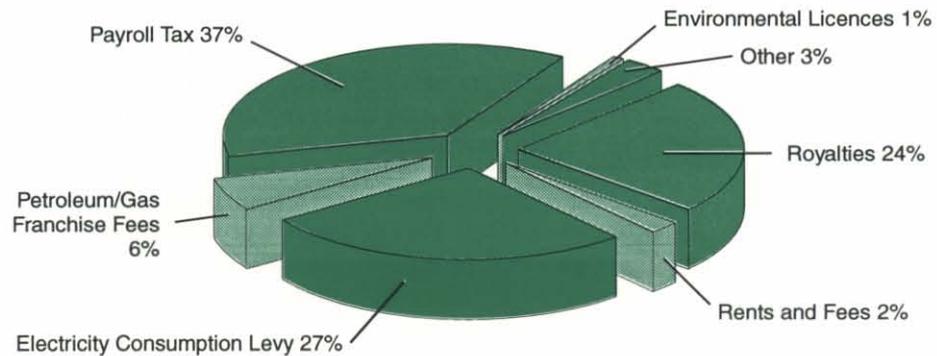
Taxes and charges paid to the State Government increased slightly from \$28.4 million in 1993/94 to \$29.4 million in 1994/95. An increase in royalty payments was offset by a fall in payroll tax and electricity consumption levy payments.

	1993/94 (\$,000)	1994/95 (\$,000)
Royalties	3,938	7,150
Rents and Fees from Mineral Lands	628	557
Electricity Consumption Levy	9,068	7,870
Petroleum/Gas Franchise Fees	667	1,681
Vehicle Fees	144	128
Stamp Duty	243	14
Payroll Tax	12,489	10,975
Land Tax	371	360
State Debit Tax / FID	246	363
Environment Licences	436	214
Other	126	129
<b>Total State Government</b>	<b>28,356</b>	<b>29,441</b>

*Source: Tasmanian Chamber of Mines company surveys and Tasmania Development and Resources*

## Royalty Administration

The 1994/95 budget estimate for royalties was based on revenue received in 1993/94. Record high metal prices for copper resulted in royalty on profits being significantly higher than estimated. The actual amount of royalties received was \$8.65 million, which was approximately \$3.55 million more than budgeted and \$4.7 million more than collected in 1993/94.



### ***Audit***

The Mines Inspectorate continues to provide significant assistance in the validation of production and royalty returns. The ongoing interrogation of the mining lease database highlights areas for further investigation.

Of the major mining companies, Mt Lyell and The Cornwall Coal Company NL were audited during 1994/95.

The royalty administration program was audited by Price Waterhouse during 1994/95, with a favourable report on practices and procedures being provided to the Director of Mines.

### ***Policy Review***

A review of royalties on Tasmanian minerals and construction materials was completed and approved by the Government. The progression of the recommendations has been suspended pending wider discussion with industry, the community and stakeholders.

## **METAL PRICES AND FUTURE TRENDS**

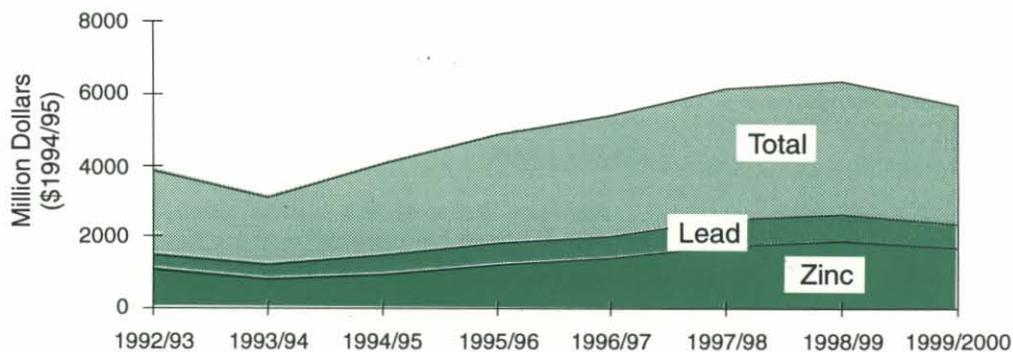
The strong growth in the global economy experienced over the last fifteen months has resulted in significant increases in most commodity prices. The majority of industrialised nations, with the notable exception of Japan, are experiencing a strong economic recovery. As a result, base metals prices have continued to recover from the low prices experienced in mid-1993, and most are predicted to rise further during 1995/96 due largely to continuing levels of demand in the world market, particularly in Asia.

Aluminium and base metals prices increased rapidly during the first half of 1994/95. With world economic growth assumed to improve further in 1995 and 1996, aluminium and base metals prices are forecast to remain strong as demand strengthens and stocks decline, although iron is not predicted to have similar rises. Over the medium term, metals and metalliferous minerals prices are projected to improve over this decade as industrial production increases world-wide and mineral exports from the Soviet Union fall from their current high levels. Mineral resource exports constitute Tasmania's largest single export category, contributing \$627.8 million or 39% of total exports. Accordingly, the forecast for commodities such as zinc, aluminium, iron and steel is of particular importance to the Tasmanian economy.

Australian mineral resource exports are projected to increase gradually towards the end of the 1990s. By the end of the decade the value of mineral exports, in 1994/95 dollars, is projected to be 28% higher than the three-year average ended 1993/94.

The value of Tasmania's exports of processed metals and metal products fell by 11% in 1993/94 to \$452 million, reflecting lower zinc and aluminium prices. However as detailed above, Tasmanian exports of mineral resource commodities

Source: ABARE



over the next three years should benefit from the increase in world demand and a consequent rise in prices.

## Factors affecting price movements

### The global economy

The economic experience among major OECD countries has been varied in recent years. Japan and most countries in Western Europe have lagged behind the economic downturn and subsequent recovery of the United States and some smaller countries such as Australia and Canada. OECD economic growth is estimated to have strengthened from 1.3% in 1993 to around 3.2% in 1994, largely reflecting strong growth in the United States and a turnaround in economic growth in Western Europe.

OECD growth is projected to remain stable in 1995, with stronger growth in Western Europe and Japan but a moderation of growth in the United States. Growth is expected to increase in 1996, before easing gradually nearer the end of the decade.

World commodity prices began to rise towards the end of 1993. This increase reflected higher commodity demand from those countries where economic growth was starting to strengthen, as well as continued strong demand from countries where high economic growth had been maintained.

The US economy slowed in the first half of 1995, resulting in a lower demand for base metals. The strong Yen and DM have reduced the chance of Japan and Germany offsetting the US slowdown. In this environment, base metals prices are likely to weaken in the second half of 1995. Demand for base metals is likely to bottom towards the end of 1995, when lower interest rates can be viewed as a precursor to higher economic growth. World industrial production is predicted to grow at just under 4% per annum in 1996 and 1997.

Risks to this scenario are:-

- that the current instability will result in the combination of rising interest rates and lower growth;
- the world economy could have a hard rather than a soft landing; and
- trade friction between Japan and the US escalates.

The forecast outcome for Australia is for the total value of commodity exports to fall slightly from \$48.8 billion in 1993/94 to \$48.6 billion in 1994/95, before recovering significantly to \$53.6 billion in 1995/96. The total value of Australia's commodity exports by 1999/2000, in 1994/95 dollars, is projected to be around 23% higher than in 1994/95.

Tasmanian primary exports are expected to follow a similar pattern, with steady growth expected until 1997 before gradually easing towards the year 2000.

## Investment Funds and Stock Levels

Despite large falls in London Metal Exchange (LME) stocks since the start of the 1995 year, metal prices have failed to regain their January peaks. This price weakness is due to hedge fund selling of copper and an expectation of weaker base metals prices.

Another factor is the role of bank financing of LME stocks. In 1994, large portions of the LME stockpiles were tied up in medium term financing/warehouse arrangements. During 1995 the unwinding of these arrangements has made more stock available to the market and increased the downward pressure on prices that large drawdown would otherwise have had. The first quarter of 1995 has also seen a rise in non-LME stocks of all the main metals, encouraging price weakness.

## Individual Metals

*Annual Base Metals  
Price Forecasts (c/lb)*

Year ending 31 December	1994 <sup>a</sup>	1995 <sup>e</sup>	1996 <sup>e</sup>	1997 <sup>e</sup>	1998 <sup>e</sup>
Aluminium	67.0	80.8	80.0	87.5	92.5
Copper	104.6	119.8	103.8	105.0	107.5
Zinc	45.3	50.1	54.0	55.0	60.0
Lead	24.8	29.0	34.5	36.0	35.0
Tin	247.4	275.0	305.0	330.0	345.0

*Source: Macquarie Equities Limited, Resources Outlook, June 1995  
Key: a — Actual, e — Expected*

**Copper** has maintained a strong demand, with stocks approaching historically low levels in recent months. The rate of stock decline has been slowing since the start of 1995 after allowance had been made for the 102 000 tonne rise in Japanese GSP stocks during the first quarter. Prices are likely to move down in the second half of 1995 in anticipation of oversupply in 1996, before recovering slowly in 1997 and 1998.

**Tin** fundamentals have improved markedly during 1995, largely due to production problems in Bolivia and Brazil and a fall in Chinese exports. The demand for tin is also rising strongly and LME stocks have been falling rapidly. Prices should rise strongly in the short to medium term, although the potential for China to significantly increase its exports remains.

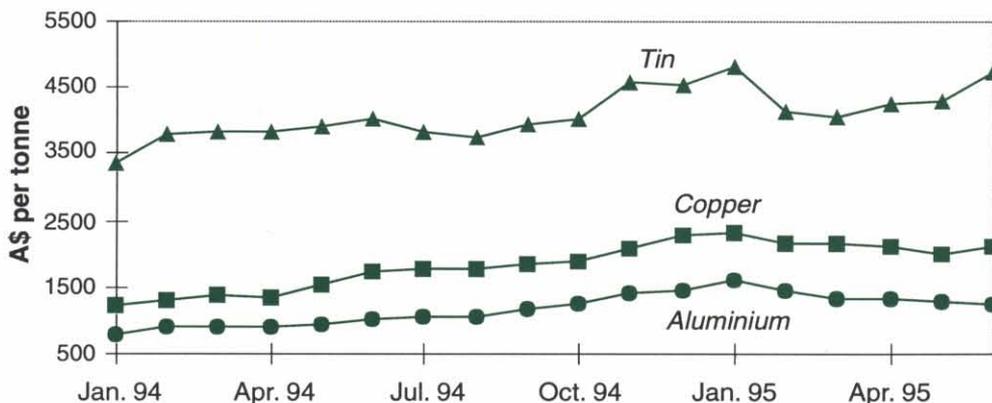
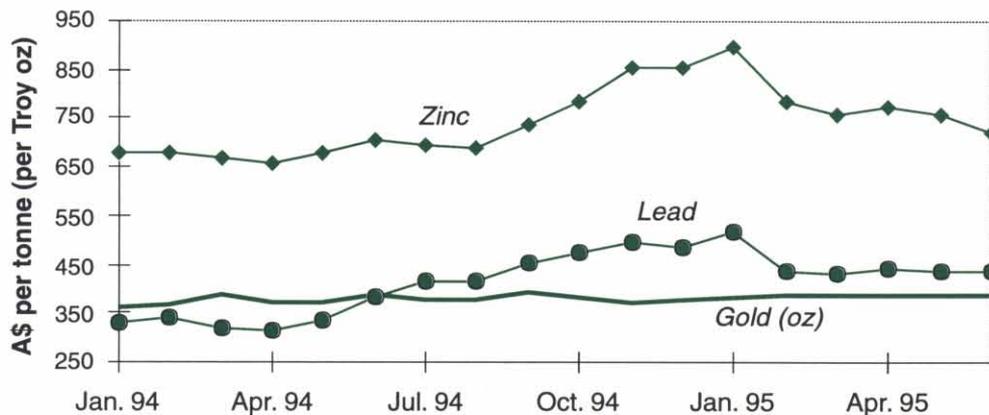
**Aluminium** price forecasts for the short to medium term have improved, with significant increases in demand growth in 1995. Production cuts agreed to under the *Memorandum of Understanding* have led to a large fall in LME stocks since mid-1994. The 1994/95 year was marked by fluctuating prices due to speculative buying and restricted availability. Production is likely to be approaching normal levels towards the end of 1995, although stocks should still be falling in the first half of 1996. Further modest stock reductions are projected during 1997 and 1998, as production attempts to meet rising demand.

**Iron ore** prices are set to increase in 1995 for both lump iron ore and fine iron ore. Lump iron ore is able to reach higher prices than fine iron ore due to maintenance of a premium at current levels.

**Zinc** prices are expected to recover from recent low levels as stocks fall steadily, although large mine additions may slow the rate of recovery. There has been a fall in Asian smelter output due to a shortage of Australian, Chinese and Peruvian zinc concentrate. These shortages are likely to be temporary, as rises in mine production are expected in the medium term. Current world concentrates shortages should be reduced towards the end of 1995, allowing smelter production in Asia and Europe to rise.

**Gold** fundamentals are positive, leading to the expectation for higher average prices in 1995 compared to 1994. Continued weakening of the US dollar has encouraged increased physical demand for gold in parts of Asia and Europe.

*Average Monthly LME  
Prices, January 1994  
to June 1995*



**Lead** stocks continue to fall, leading to further upward pressure on prices. US demand for lead has been very high but is beginning to slow. Primary lead production is expected to fall again in 1995 due to a shortfall in mine production.

### **Exchange Rates**

Rising commodity prices and higher interest rates pushed up the Australian dollar against most major currencies during 1994. Weaker commodity prices and falling short-term interest rates reduced support for the Australian dollar in the first half of 1995. Consequently the value of the Australian dollar fell (even against the weak US dollar) but has recently levelled out as commodity prices stabilise.

The 1994/95 financial year was typified by a strong appreciation of the Yen against all other currencies, and the US dollar in particular. The impact for Australian companies has been generally positive. The Australian dollar has exhibited some volatility against the trade-weighted index, and since January 1995, has lost ground against all major currencies largely due to Australia's balance of payments deficit. The Australian dollar is predicted to appreciate in the short to medium term on the back of positive commodity prices outlook and interest rate differentials versus the US.

### **EMPLOYMENT**

Direct employment in the mining and mineral processing sector remained stable in 1994/95, indicating the change in fortunes for the sector in Tasmania. Previous years have been marked by mine closures and heavy retrenchments in an effort to gain international competitiveness. Recent announcements of new projects and expansions have indicated a significant resurgence for the mining and mineral processing sector.

Employment generating and/or securing investment projects include the Mt Lyell project, the Rendeep Project, and the Beaconsfield Gold project. Indications are that the sector has undergone much of the restructuring necessary to become internationally competitive, and is set for sustainable growth in employment in the medium term.

## INVESTMENT

The 1994/95 financial year marked a turning point for the mining and mineral processing sector in Tasmania. Several large industrial companies have indicated plans for new or expansion projects.

Capital investment in the mining and mineral processing sector grew strongly in 1994/95. A Tasmanian Minerals Council survey identified \$146 million of capital expenditure estimated to have taken place in the mining industry in the 1994/95 financial year — double the figure for the previous year. The major investment projects are outlined below.

### *Copper Mines of Tasmania*

In June 1994, the State Government signed a Memorandum of Understanding with Gold Mines of Australia Limited (GMA) to take over the Mt Lyell lease on the departure of Renison Goldfields Consolidated. GMA announced on 2 June 1995 that it had approved the Mt Lyell redevelopment project following a detailed feasibility study and satisfactory resolution of power and concentrate transport contracts. GMA has established a subsidiary company, Copper Mines of Tasmania (CMT), to carry out work on the Mt Lyell copper and gold mining leases.

Capital expenditure prior to production commencement will be approximately \$40 million. Based on current ore reserves, the project life is at least ten years and GMA is confident that these reserves will be extended considerably. Research is continuing on downstream processing options and GMA intends to proceed to production of copper metal after four years if adequate reserves are proved.

National Mine Management Pty Ltd has been awarded the contract for all mine development and production. Total contract value is estimated to be \$100 million.

### *Renison Goldfields Consolidated Limited*

The Henty Gold Project is wholly owned by Goldfields Limited, a subsidiary of Renison Goldfields Consolidated Limited (RGC). An underground mine, expected to produce about 110 000 tonnes of ore annually for its scheduled 4½ year life, is planned. The capital cost for the project is \$53 million. Production is scheduled to commence in calendar year 1996.

RGC announced in June 1994 that a \$34 million project had been approved at the Renison tin mine. The project, known as Rendeep, is based on ore bodies delineated by a diamond-drilling program which commenced in 1989. Mine life will be extended from a minimum of seven to at least 13 years; before the Rendeep commitment, mine life was estimated at only three to four years. The Rendeep project will employ an additional 50 people. A new shaft, scheduled to commence operations in 1996/97, will allow an increase in production to 9000 tonnes of tin a year, and will significantly reduce mine operating costs and lower the mine's position on the international tin mining cost curve.

### *Pasminco Limited*

Pasminco Limited has committed itself to a deep exploration project at Rosebery, with \$45 million to be spent over the next four years on defining and developing 10 million tonnes of ore below current working levels. Of this amount, \$25 million is earmarked for ore access for diamond drilling and mine production purposes.

### *Temco*

Temco is investigating investment projects to increase the quality of its product, add value and increase capacity. Commitments to several of these projects are anticipated during 1995.

### *Comalco Aluminium*

Investment at Bell Bay principally comprised environmental upgrades and safety equipment, totalling around \$30 million.

## Beaconsfield Gold

Beaconsfield Gold is going ahead with a \$2.1 million program over 12 months to further advance the evaluation and development of its gold mine project.

## Tioxide Australia

Tioxide Australia, having dealt with effluent problems at the Heybridge plant, is now investigating expansion plans.

## MINERAL EXPLORATION AND DEVELOPMENT

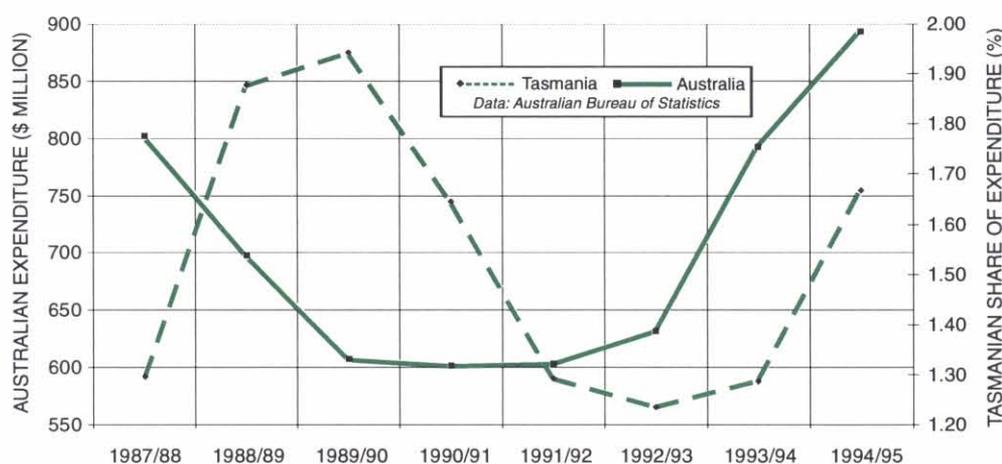
During 1994/95, Tasmania recorded its highest annual mineral exploration expenditure for a decade, with the expenditure figure of \$14.9 million being 46% higher than the previous year. This was the second successive year of growth following the decline of the early 1990s, and was mainly due to the secure investment climate in Tasmania, better base-metal prices, and the effect of the Netgold program in the northeast of the State.

Tasmania's share of national exploration expenditure, at 1.67%, was also the highest for five years. The rate of growth in this State during the last five years was 50%, 2% above the national growth figure.

Year	Australian Expenditure (\$ Million)	Tasmanian Expenditure (\$ Million)	Tasmania as % of Australian Expenditure
1985/86	442.0	10.6	2.39
1986/87	556.8	10.9	1.96
1987/88	802.2	10.4	1.30
1988/89	697.6	13.1	1.88
1989/90	607.5	11.8	1.94
1990/91	601.5	9.9	1.65
1991/92	603.7	7.8	1.29
1992/93	631.7	7.8	1.23
1993/94	792.6	10.2	1.29
1994/95	893.4	14.9	1.67

Source: Australian Bureau of Statistics  
Actual and Expected Private Mineral Exploration, Australia.

Total Australian exploration expenditure and Tasmanian share of expenditure, 1987/88 to 1994/95



## PROMOTION OF TASMANIAN PROSPECTIVITY

Mineral Resources Tasmania accepts that this State must demonstrate a truly competitive investment climate to attract the investment dollar against fierce competition from other Australian States and, as importantly, other nations. Towards this end, promotion will continue to rely on:-

- demonstration of genuine mineral prospectivity;
- the emergence of Tasmania as a 'born again gold province';
- high quality geoscientific data, in both digital and hard-copy format, as an aid to target selection;
- expansion of known zones of mineral wealth by funding of research and data accumulation exercises in areas of the State not presently of interest to industry; and
- funding to maintain the necessary level of geoscientific, pre-competitive data accumulation and for promotional programs overseas and interstate.

Strategic and operational planning forums will review progress towards the goal of sustainable growth in the State's mineral sector. Assistance and advice from industry, and from the Centre for Ore Deposits and Exploration Studies (CODES), will continue to be solicited.

Funding success, for the long-term returns associated with data gathering and geoscientific research, requires continued Government support and understanding.

### Structure of Mineral Resources Tasmania and its linkage with TDR

The structure of Tasmania Development and Resources (TDR), the Tasmanian Government's Department of State Development and Resources, has continued to evolve since its origination by amalgamation in February 1993.

In December 1994, the Industry Safety and Mines Division (ISM) was formed by amalgamation of the former Mineral Resources Tasmania with the Industry Services Division. The geoscientific and tenement management branches of Industry Safety and Mines will continue to operate under the trading name of Mineral Resources Tasmania (MRT).

Industry Safety and Mines' strategic plan has been developed to complement the TDR's role statement and to support the Government strategy for industry development in Tasmania, as encapsulated in the document *A Decade of Growth*. The strategic plan takes into account the issues which contributed to the decline of mineral exploration, and of the mining and mineral processing sector, during the last decade and builds on the strong indications of a resurgence demonstrated in the 1993/94 and 1994/95.

The turnaround can be attributed to:-

- Supportive Government policies and legislation;
- The commitment by Mineral Resources Tasmania to the supply of high-quality geoscientific data packages in digital format to explorers;
- The focus on promotion of the State's mineral prospectivity;
- Indications of a sustained improvement in metal prices; and
- The possibility that Tasmania could be a gold province of significance.

The Mineral Resources Tasmania's mission for 1995/96 is:-

*"To achieve sustainable and environmentally responsible development of the State's mineral sector and provide for geoscientific understanding in support of effective land management".*

The main objectives are:-

- To create a competitive investment climate for growth in exploration for mineral deposits;
- To support the economic growth of Tasmania by developing and maintaining a geoscientific database of international standard; and
- To promote investment in the Tasmanian mineral industry by marketing geoscientific information.

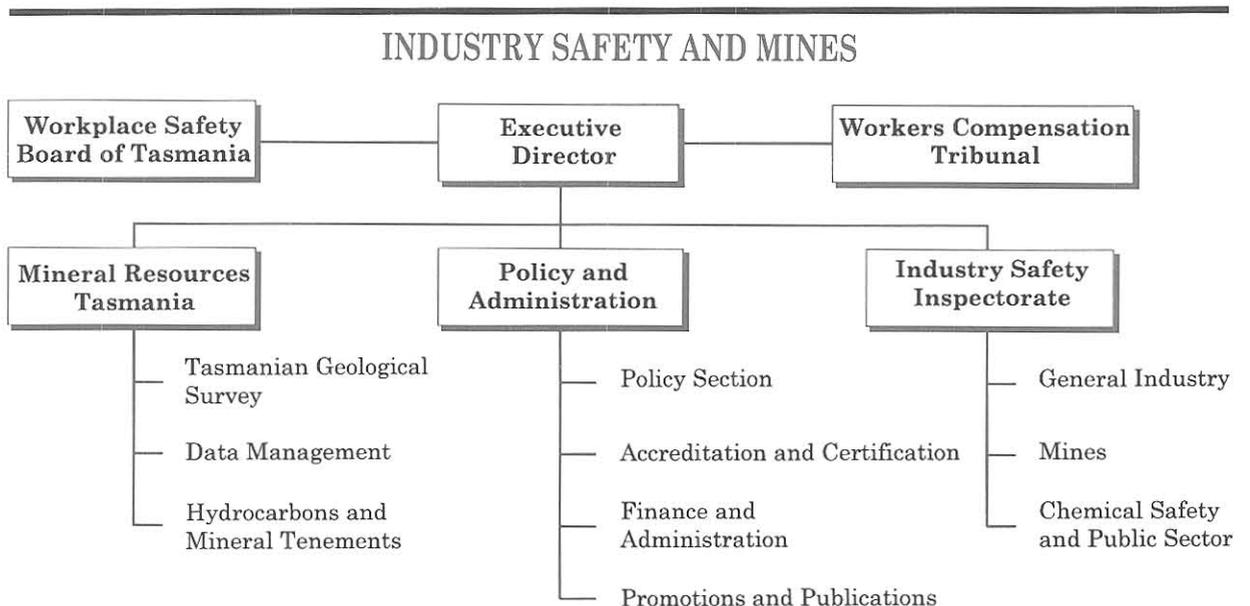
The focus of MRT is to continue to produce and promote up-to-date geoscientific information on Tasmania as an aid to the mineral exploration industry, other government agencies and the general public, in order to promote rational land use planning and environmental management.

MRT will continue to:-

- Be responsible for the acquisition of geoscientific data for responsible land management of Tasmania, as well as the regulation and environmental monitoring of the Tasmanian mineral exploration and mining industry;
- Work for a sustainable future for mineral exploration, mining, quarrying and mineral processing industries. The future will be based on new mineral discoveries arising out of strong private sector commitment to Tasmania's mineral prospectivity; and
- Encourage and assist the mining sector to make better use of presently identified resources; explore for new resources; develop industrial mineral activities through market research; and help improve its environmental management performance.

These aims are based on a number of principles. Firstly, the long-term vigour of Tasmania's mining sector depends on strong exploration and research expenditure, without which new opportunities are not identified, nor are identified resources best exploited. Secondly, the pursuit of excellence in environmental management benefits the mining sector as well as the broader community, and increases community support for the sector.

With the December 1994 amalgamation that formed ISM, staff of the Mining and Mineral Processing Section of the Development Division of TDR, who were formerly located at Rosny Park, returned to the Hobart office. Although there is now a physical separation from this group, a strong liaison still exists, and projects for promotion of mineral exploration and mining development are still conducted as joint exercises with MRT.



## MANAGEMENT STRUCTURE

The management structure of ISM includes an Executive Director, Mr M. W. D. Ayre, who currently also holds the statutory titles of Director of Mines and Director of Industry Safety. There are three Branches of ISM: Mineral Resources Tasmania, Industry Safety Inspectorate, and Policy and Administration.

Mineral Resources Tasmania (MRT) consists of three Sections:-

- Tasmanian Geological Survey;
- Hydrocarbons and Tenement Management; and
- Data Management.

MRT is managed by the Director Mineral Resources and State Chief Geologist, who is responsible for the programs which deliver the Branch outcomes. At the branch level the management structure includes:-

- Director Mineral Resources and State Chief Geologist — Dr A. V. Brown
- Managing Geologist (Hydrocarbons and Tenements) — Ms C. A. Bacon
- Managing Geologist (Geological Survey) — Dr K. D. Corbett
- Managing Geologist (Geological Survey) — Dr G. R. Green
- Chief Geologist (Engineering Geology and Groundwater) — Mr W. L. Matthews
- Manager, Data Management — Mr K. G. Bird

## Review of MAJOR GEOSCIENTIFIC PROJECTS 1994/95 *National Geoscience Mapping Accord*

Mineral Resources Tasmania's major geoscientific data gathering project during 1994/95 was its participation in the National Geoscience Mapping Accord (NGMA) TASGO project. The NGMA is a co-operative arrangement between the Commonwealth and the State Governments, through the Australian Geological Survey Organisation (AGSO) and State/Northern Territory Geological Surveys, to provide a new generation of geoscience maps and data sets for Australia through utilisation of state-of-the-art technologies and the collaboration of Governments, the mineral and petroleum industries, and universities.

The TASGO project was designed to increase exploration, development and investment in mineral and petroleum exploration in Tasmania through:-

- the improved definition of mineral and petroleum prospectivity zones, especially those areas not currently being explored, and;
- more efficient exploration in strategic prospectivity zones, based on a better understanding of Tasmania's deep structure, its known mineralisation, and of the potential for petroleum.

The project will provide important new geophysical and geological information which, when integrated with existing data, will be used to define the major structural zones and fluid paths responsible for Tasmania's numerous mineral deposits.

Expected benefits include:-

- improved definition of mineral and petroleum prospectivity zones;
- better three-dimensional understanding of the major structures controlling mineral and petroleum deposits;
- more reliable resource assessment procedures and land use planning information.

Data packages flowing from the NGMA project will help to promote Tasmania as a place to explore by increasing exploration potential which, in turn, will lead to future development investment. Future MRT projects will be designed around the results of this NGMA project.

The achievements of TASGO in 1994/95 include:-

- A geological synthesis of all published and unpublished geological data on Tasmania, available to MRT, was undertaken and completed. This synthesis will provide an up-to-date summary of the geology of Tasmania and its surrounds in a simple and concise format. The synthesised data will be available as a time-space diagram, a stratotectonic map, and explanatory notes. These products will be released during November 1995.
- An offshore airborne geophysical survey was undertaken over areas around southern, western, northern, and northwestern Tasmania to King Island. This survey was designed to help define the optimum route for the marine seismic traverse, as well as to integrate data over Tasmania with that from the Bass Basin. A geological interpretation map of the new data will be produced and released in November 1995.
- A marine seismic survey was carried out around the coast to study the State's major rock units and the structures that bound them as they extend offshore. Much of Tasmania's geology is not easily accessible to seismic surveying onshore because of the extent of built-up areas, rugged and forested terrain, and the lack of long straight roads. Interpretation of these data will take place during 1995/96.

- Five on-land seismic lines, over areas of major structural interest, were undertaken by AGSO's Land Seismic Group. Deep seismic data to 20 seconds two-way-travel time were acquired. Gravity readings were recorded by MRT staff along each of the seismic traverses. Preliminary interpretations of the data collected will be available during November 1995. Groundwater information was also collected from the shot holes.
- A statewide network of up to 46 seismic refraction recording stations was established to record data, on land, from airgun firings during the marine seismic cruise. The information obtained represents a huge new data set for studying Tasmania's depths by tomography, and will complement the ship's data. Two reverse shots, fired from central Tasmania, completed data acquisition for the tomography experiment. The tomographic interpretation is scheduled to start during 1995/96 and continue into 1996/97.

Products that have so far been produced for the project will be released to industry at a one-day workshop to be held in Hobart in November 1995.

### ***Project TIGER***

The "Tasmanian Information on Geoscientific and Exploration Resources" (TIGER) project was developed as a major initiative in MRT's move away from the production of traditional printed reports and geoscientific maps into digital data format and data bases, with a print-on-request capacity.

The objectives of the project are to:-

- aid the production of information packages for sale to exploration companies, interested consultants and other clients;
- enable fast, accurate and comprehensive retrieval of information to assist the Agency with planning and policy decisions;
- allow for better analysis and interpretation through the use of modern data manipulation packages, and;
- ensure the Agency's large store of information resources is secure, responsibly managed, and remains in a usable format for future use.

The project has been divided into two phases: the first, to develop a Public Access Inquiry System (PAIS); and the second, to develop geoscientific information and mining tenement administration systems and integrate the spatial and textural components of both phases.

Phase 1 was undertaken during 1994/95 and was achieved through the provision of an effective computerised Public Access Inquiry System (PAIS) in the Rosny Park office. This system provides external clients with 'self help' access to information resources within MRT and became available in late April 1995. Information systems have also been developed for internal clients to support the counter inquiry system through data entry, maintenance and inquiry.

PAIS was released as part of the public data launch in Hobart in April 1995 and allows users to access:-

- Information on land available for exploration and mining, and up-to-date mining tenement information including mineral leases, exploration tender areas, retention licences, prospecting licences, miners rights and historic data;
- Reference information, including exploration company reports and internal geological and petrological reports;
- Information on airborne and land-based geophysical surveys in Tasmania, and;
- Drilling information, including the location and identity of drill holes as well as reference and drill log locations.

Client access to PAIS also allows:-

- Access to information on all digital data held by MRT;
- Self-help searching using counter enquiry system; search results can be provided in hard copy or digital form, and;
- Access to the agency's geologists and GIS facilities for in-depth searching.

Phase 2 of TIGER began in 1994/95 with the employment of temporary staff under a Geographic Information Systems (GIS) project, funded from TDR's Assistance to Industry (ATI) budget. This three-year project will enable all transferable geoscientific information from MRT's published and unpublished sources, and open-file company reports, to be placed into integrated digital data bases. Interim digital data structures were developed during 1994/95 so that the data gathered under the GIS project could be readily incorporated into the final data base structure when it is written. The final data base structure will incorporate the current Arc/Info spatial data sources and a proprietary textual data base server.

Phase 2 of TIGER will continue during the next two financial years, with the development of a Business Case in 1995/96 to allow the full extent of the project to be evaluated. This will be followed by the production of the final data structures and transfer of the data gathered from the interim structures. It is hoped that the final data structures will be written during 1995/96 and that the core in-house information will be extracted and transferred to the final format by the end of 1996/97. With continued maintenance and updating of the system after 1996/97, the objectives of the project will be fulfilled as an ongoing service to clients.

## PROMOTIONAL ACTIVITIES AND DATA LAUNCH

Staff of the Geological Survey, in co-operation with the Mining and Mineral Processing Group, undertook promotional trips to most Australian capital cities to visit mineral exploration companies, considered on a number of criteria to be possible future explorers in Tasmania. Data packages on areas of possible interest were developed and an updated version of MRT's booklet *Mineral Exploration Opportunities in Tasmania* was compiled to introduce the companies to Tasmania.

A public data launch was held in Hobart in April 1995 at which several new maps and data bases were released. These included:-

- Two new 1:250 000 scale digital geological maps, one of northwest Tasmania and one of southeast Tasmania;
- Upgraded and new data base sets of mineral occurrences, drill hole locations, stream geochemical data, and whole-rock geochemical data for the Northeastern and Southeastern 1:250 000 scale map sheets;
- Five new digital 1:25 000 scale geological maps and associated data bases over the northeastern gold province;
- Five new digital 1:25 000 scale maps and associated data bases over the Mt Read Volcanics belt in western Tasmania, and;
- Two 1:50 000 scale aeromagnetic, radiometric and interpretative geological data sets over the Arthur Lineament in northwestern Tasmania.

The Arthur Lineament area, like the NETGOLD area of northeastern Tasmania, has not been explored by modern exploration techniques in recent years. The area has proven reserves of iron ore (magnetite), base metals, silica flour, magnesite, dolomite, ochre, recoverable amounts of gold and trace amounts of diamonds.

The new aeromagnetic and radiometric data over the Arthur Lineament has revealed that the magnetic signature of geological units containing the Savage River iron ore mine continues north for approximately 14 km; that the Keith River gossan lies along a fault zone which contains numerous other high magnetic response areas; and that the sequence which contains the Lyons River magnesite deposits extends at least 16 km to the southwest.

## LEGISLATION

Preparation and drafting of the *Mineral Resource Development Bill 1995*, which is to be tabled in the 1995 Budget Session of State Parliament, was completed during 1994/95. The Bill provides for development of the State's mineral resources consistent with sound economic, environmental and land use management, including the issue of mineral rights ownership.

The new legislation will replace the *Mining Act 1929*, the *Aid to Mining Act 1927* and the *Mineral Resources Act 1951*, and will also provide for matters currently covered by regulations under the repealed *Mines Inspection Act 1969* which fall outside the scope of the new *Workplace Health and Safety Act 1995*.

## GROUNDWATER DRILLING

A private contractor was engaged to drill fourteen holes to an average depth of about 100 metres to complete a groundwater assessment project in the Oatlands area. Several holes encountered small flows of irrigation-quality water. The results of the study, when compiled, will provide valuable information to property owners on groundwater prospectivity.

## MACQUARIE ISLAND

Two Geological Survey geologists undertook a project to produce a geological map of Macquarie Island during the summer of 1994/95. The project was funded by the Australian Antarctic Foundation and undertaken by the Tasmanian Geological Survey on behalf of the Tasmanian Government. The purpose of the project is to produce a modern 1:25 000 scale geological map of the island for use by educational, university, Southern Ocean researchers, and the international and general communities.

Because of the unexpected complexity of the geology, the southern end of the island was not able to be mapped in the time allocated. One of the geologists will return to the island between September and December 1995 to complete the task, supported by research funding through the Geology Department of the University of Tasmania. Under the original agreement with the Australian Antarctic Foundation, the map and explanatory notes will be published by MRT on behalf of the Tasmanian Government.

## REPRESENTATION ON INDUSTRY AND GOVERNMENT GROUPS

Officers from MRT represent Tasmania on mineral issues at the Ministerial, Standing Committee of Officials, and various subcommittees and working groups of the Australian and New Zealand Minerals and Energy Council (ANZMEC). The Director Mineral Resources also represents TDR on the Land Information Co-ordination Committee (LICC), and is one of two representatives from TDR on the Forest Policy Taskforce (FPT).

During the year MRT staff interacted with industry and other agencies through quarterly meetings of the Mineral Resource Industry Advisory Panel (MRIAP) and the bi-yearly Tasmanian Minerals Council Exploration Group meetings.

## PERFORMANCE INDICATORS

Private sector mineral exploration in Tasmania has grown steadily for the past two years after the low levels of 1991/92. A number of factors have contributed to this growth, including increased expenditure on drilling by companies on exploration leases which are reaching maturity, activity in northeastern Tasmania as a result of NETGOLD, and the production and marketing of new geoscientific data to promote the State to investors.

The uncertainty of land tenure in other States arising out of the Native Title issue, and other economic factors, continue to play a part in the increase in exploration spending within the State.

- During 1994/95, exploration expenditure grew by 46% from \$10.2 million in 1993/94 to \$14.9 million;
- In the previous financial year 125 exploration licences were held or were under application, covering a total area of 8012 km<sup>2</sup>. This increased in 1994/95 to 136 licences or applications covering an area of 11 648 km<sup>2</sup>, representing an increase of 45% in the area covered and 9% in the number of licences;
- Drilling is another important indicator of exploration effort. The figure of 28 740 metres for 1994/95 was slightly down on the adjusted figure for the previous year (30 883 metres), but was 33% above the long-term average (1987–94) of 21 650 metres per year.

This evidence of increased exploration activity has been accompanied by a number of exciting capital commitments by the mining and mineral processing sectors as noted in the *Mineral Sector Overview* section

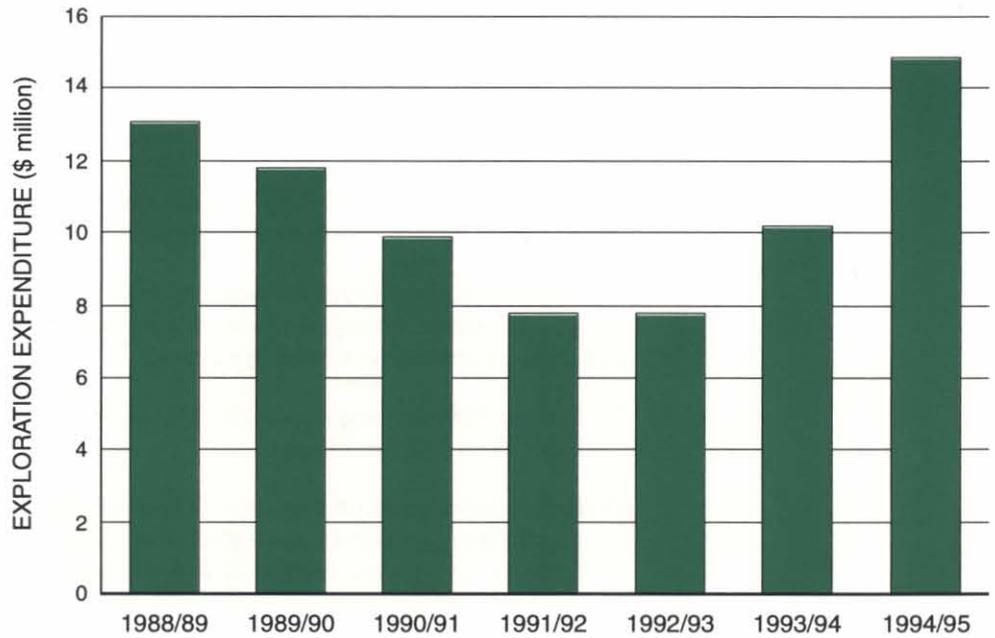
At 30 June 1995, mining leases covered 128 km<sup>2</sup> or 0.2% of the State. The following exploration licences (EL) and retention licences (RL) were either pending or granted.

<i>Lease Type</i>	<i>Area (km<sup>2</sup>)</i>	<i>% of State</i>
Metallic EL and RL	8153	12
Non-metallic EL and RL	713	1
On-shore petroleum EL	3478	5

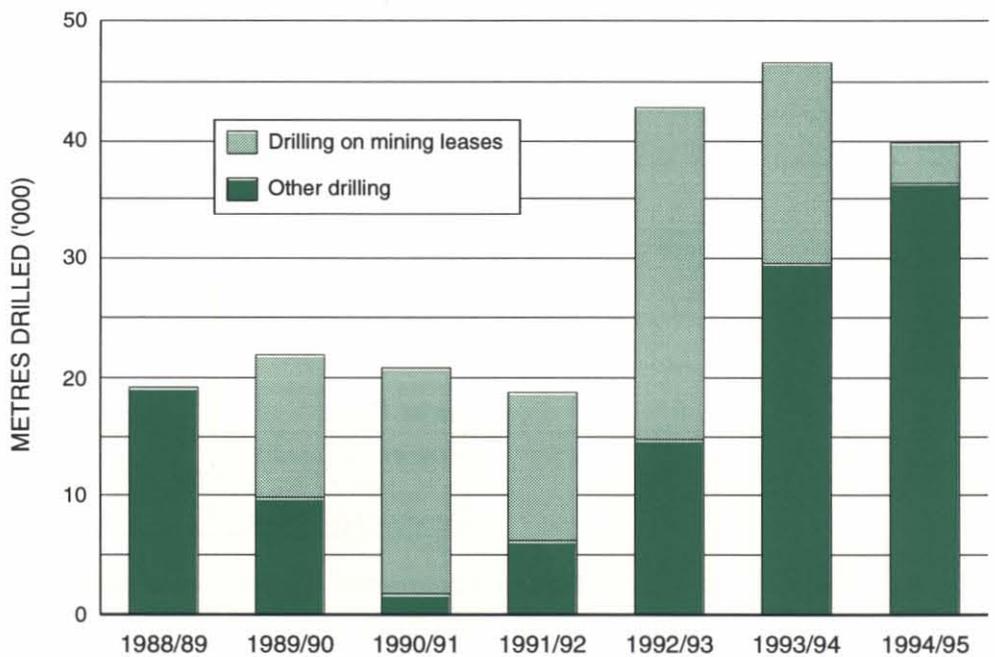
Fifteen Exploration Tender Areas were offered during the year and the successful companies were given Exploration Licences. Companies submitted 157 exploration reports. These were indexed on the TASXPLORE database and incorporated into the division's collection, which totalled 4467 reports at 30 June 1995. The reports are a valuable component of Tasmania's geological and mineral knowledge. Microfilming of reports continued, and microfiche of all open-file reports are available.

# PERFORMANCE INDICATORS

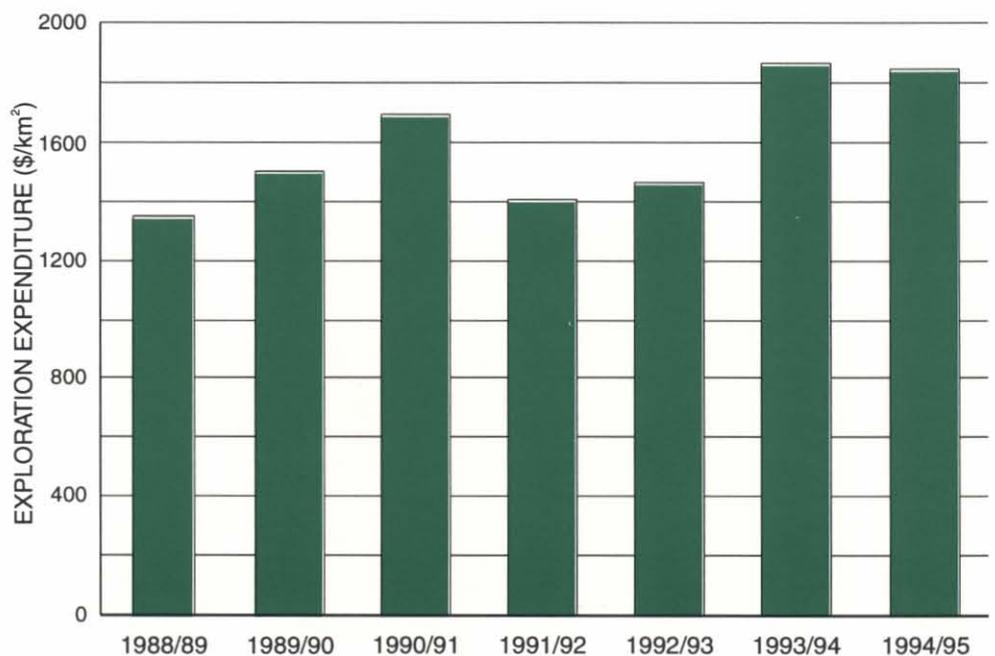
*Total Tasmanian exploration expenditure 1988/89 to 1994/95 (ABS and MRT data)*



*Total exploration drilling 1988/89 to 1994/95 (MRT data)*

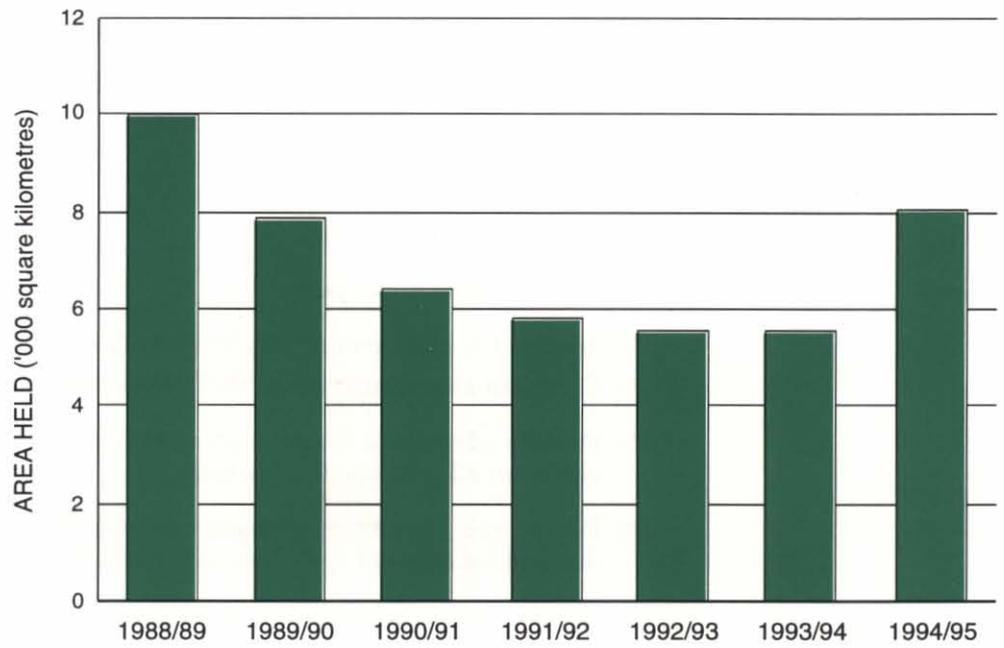


*Exploration expenditure per square kilometre ground held under Exploration Licence 1988/89 to 1994/95 (ABS and MRT data)*

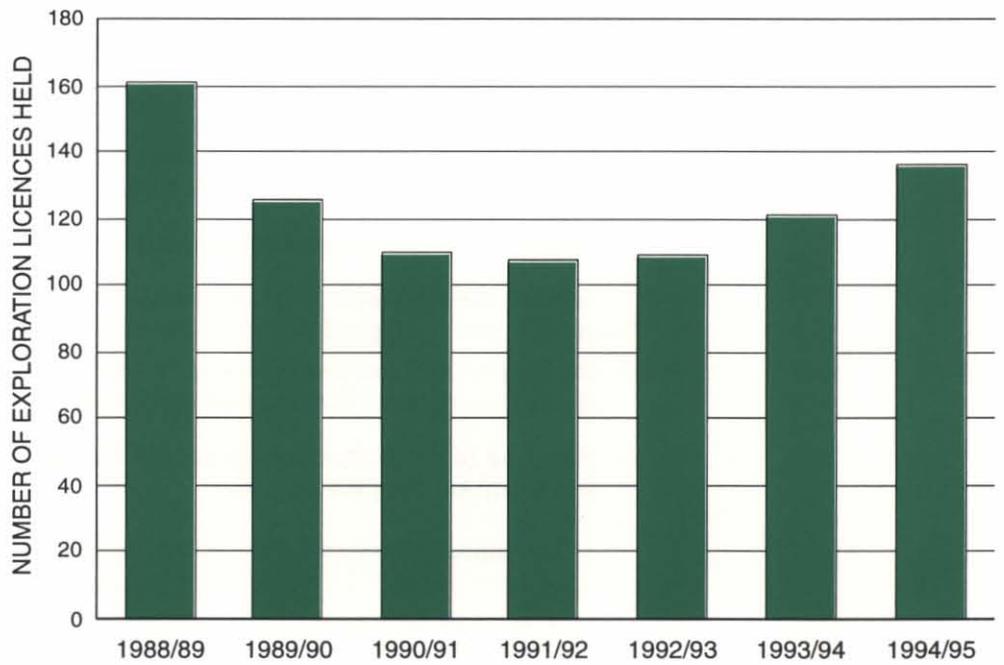


# PERFORMANCE INDICATORS

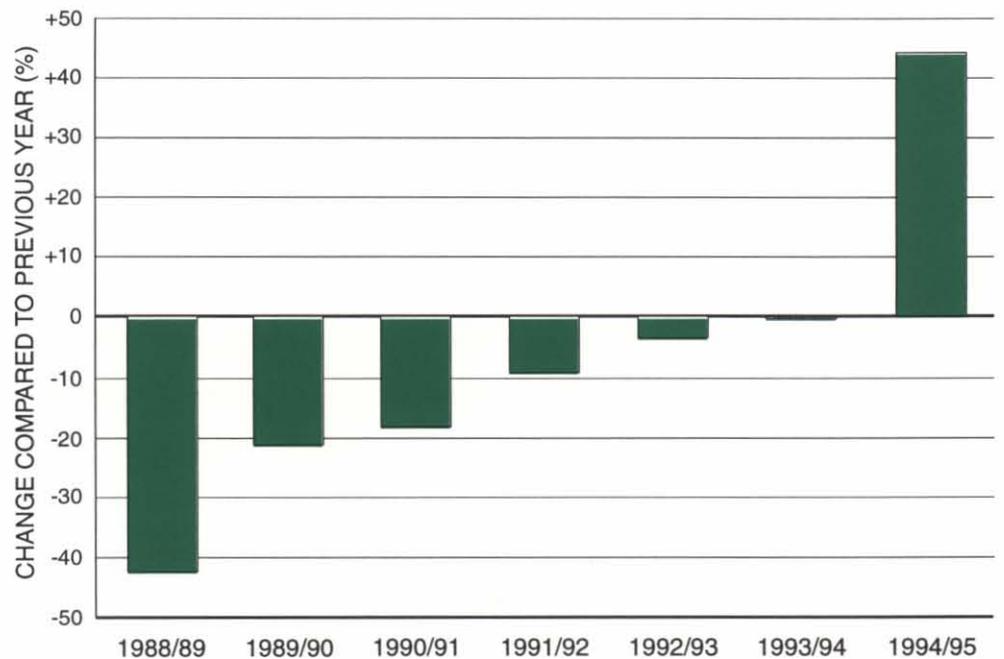
*Area held under Exploration Licences 1988/89 to 1994/95*



*Number of Exploration Licences 1988/89 to 1994/95*



*Percentage change in area held under Exploration Licences compared to preceding year*



## Tasmanian Geological Survey

The Tasmanian Geological Survey is responsible for:–

- Resource investigations and promotions;
- Engineering geology and groundwater;
- Geophysical services;
- Analytical services; and
- Petrology and mineralogy.

To achieve the objectives of this Section, the Geological Survey undertakes to:–

- Carry out assessment of the earth resource potential of Tasmania;
- Provide advice and direct support to Government, industry and the general public on all geoscientific matters;
- Devise and implement projects and strategies to assist the development of mineral exploration and other industries in Tasmania;
- Collect, integrate, interpret, publish and present information on the geology, geophysics, geochemistry, earth resources and land stability of Tasmania;
- Promote and market the mineral resource potential of Tasmania;
- Regulate and monitor the progress of mineral exploration in Tasmania;
- Provide a repository and archival services for valuable geoscientific data, drill core, rock and mineral specimens, and;
- Provide essential support services for Section activities.

To achieve the outcomes of increased and more effective mineral investment in Tasmania, the Geological Survey is led so as to ensure:–

- Staffing by high-calibre geoscientific professionals motivated by excellence in the achievement of Government objectives.
- Planning of programs and initiatives for the budget and forecast years that will facilitate the provision of:–
  - a comprehensive and competitive data base on the geology of Tasmania;
  - a focus on the zones of strategic mineral prospectivity and on the expansion of these areas of investor interest;
  - a continual review of models and concepts to take into account new information, with particular reference to ore zone target identification.
- Accurate costing of programs and justification of expenditure on the basis of past achievement and anticipated results;
- Liaison at all levels with the CODES Key Centre at the University of Tasmania, with particular accent on research projects designed to assist Government in achieving mineral resource goals;
- Strict observance of the principles of confidentiality and general ethics;
- Close involvement with the private sector and industry bodies;
- Promotion of vacant areas of high mineral prospectivity to investors by:–
  - data information packages;
  - advertisement;
  - face-to-face promotion techniques; and

- good geology and commercial awareness.
- That the Government and the community are provided with an accurate and predictive database on:–
  - groundwater reserves and threats to groundwater; and
  - engineering geology parameters affecting development and land use.
- That adequate training and career opportunities for staff are provided;
- That an *esprit de corps* is developed and that ownership of results is accepted;
- Establishment of key performance indicators against which achievement can be measured:–
  - ABS exploration figures; totals trend and percentage share of market;
  - land area under active exploration;
  - diamond drilling metres achieved; and
  - coverage of the State with GIS maps and related products.

## Regional Reports

### CENTRAL TASMANIA REGION

#### *Exploration activity*

Well over half of the private exploration expenditure in the state is directed to the Mt Read Volcanics belt in the Central Region, with the three largest exploration companies (by expenditure) concentrating their efforts in this area. This reflects the abundance of known resources in the belt, with mining operations at Hellyer, Que River, Rosebery, Hercules, Mt Lyell and Henty, and the potential for further discoveries of base and precious metal deposits.

Active exploration is being carried out on most parts of the belt, with the most intense activity in the Anthony Road area south of the Henty mine, where the three major companies have been drilling on adjacent blocks. Four companies submitted tenders for an Exploration Tender Area at Mt Darwin, with success going to 'newcomer' Platsearch NL, and to Aberfoyle Resources.

#### *Data compilation*

Five map 1:25 000 scale map sheets of part of the Mt Read Volcanics belt were completed for entry into the GIS. These maps, covering the area from the Hellyer mine to Mt Murchison, were released at the April 1995 data launch. The maps have individual legends and are available as printed-on-demand colour maps. Digital data bases for stream-sediment geochemistry (*Streamchem*), drill hole locations (*Doris*), and whole-rock geochemistry (*Rockchem*) were prepared to accompany the maps. Compilation work has commenced for five more sheets within the belt.

Geologists from the section were also involved in compiling and checking a number of sheets for the Northwest Tasmania 1:250 000 scale digital geological map, which was released at the April data launch. A comprehensive legend for this series of maps was prepared by consultation.

## ***Promotion***

The section was involved in compilation of the promotional booklet *Mineral Exploration Opportunities in Tasmania*, which outlines the State's geology and mineral resources and gives details of areas with mineral potential which are available for exploration.

The Managing Geologist and Senior Geologist, together with an officer from the TDR Development Division, undertook a promotional visit to Perth in April 1995. Twelve exploration companies were visited over three days, with each being given an outline of the State's prospectivity and a selection of maps and printed material. There was considerable interest in Tasmania, with several companies indicating that they would like to visit. Follow-up discussions have been held in a number of cases.

## ***Project generation***

Detailed planning and budgeting have been undertaken for a major geoscientific project in the Midlands-Southeast Tasmania area. This project is aimed at determining the nature of the basement rocks in eastern Tasmania, and the potential for mineral deposits in the area. Four main sub-projects will start in 1995/96.

- Examination of the Cygnet goldfield (previously active around the turn of last century) with a view to understanding the occurrence of the gold, assessing the potential for further mineralisation, and providing data packages to encourage further exploration.
- Mapping and resource assessment in the Weld River area, where some basement rocks are exposed and gold and other minerals occur.
- Mapping and data compilation of the cover sequences in southeast Tasmania, with the aim of determining where the cover is thinnest and drilling is feasible.
- Geophysical surveys, particularly aeromagnetics and gravity, will be undertaken as funding permits to provide data on the basement rocks and cover thickness.

A further project to be undertaken will be applying the new digital map data and associated data bases to enhance understanding of the Mt Read Volcanics belt, and to develop new models and interpretations which will stimulate exploration in under-explored or vacant areas.

## ***Field activities***

The emphasis on data conversion resulted in only minor field activities being undertaken in 1994/95. A report on the Anio Creek project, involving geological and geophysical investigations of an unusual magnetic feature near the northern boundary of the Cradle Mountain-Lake St Clair National Park, was completed and copies made available to interested parties. The cause of the magnetic feature is still not clear, and further work will be required before a full understanding is reached.

Other field activities included a brief visit to assess silica-dolomite resources at Maydena, reconnaissance visits to the Cygnet goldfield and Weld River area, a five-day visit to mining areas in the Mt Read Volcanics belt with visiting geologists from Phelps Dodge Corporation, and several visits to monitor company exploration activities.

## **WESTERN TASMANIA REGION**

### ***Exploration Activity***

Applications for 22 new exploration licences, covering 1438 km<sup>2</sup> of the western region, were lodged during the past year. Allstate Prospecting Pty Ltd was granted two large (406 km<sup>2</sup>) licences to explore for copper, gold and base metals in the

Arthur–Pieman area. Titan Resources NL successfully tendered for 125 km<sup>2</sup> of ground to search for gold in the Corinna area.

A number of new licences were applied for in the Zeehan area, where CRA Exploration Pty Ltd holds large areas of Ordovician limestone. This company has been actively exploring for zinc-lead mineralisation within the limestone and has reported encouraging results. CRA also holds licences for nickel and platinoids in the Melba Flats and Heazlewood areas, and for copper in the Balfour area.

Two new licences were granted at Elliott Bay, south of Macquarie Harbour, to Plutonic Operations Ltd and Macmin NL. Plutonic will explore the new licence in conjunction with two others it holds immediately to the west, in which it has been actively exploring for copper and gold.

Other new licences were granted to Pasminco Australia Ltd and Fodina Minerals Pty Ltd in the Waratah area for base metals and gold, D. C. Lane around Mt Heemskirk for precious stones and tin, H. Nolan in the Roger River area of northwest Tasmania for silica, and RNB Trading Pty Ltd for heavy minerals at Ocean Beach.

### ***Data Compilation***

A 1:250 000 scale digital geological map was compiled for northwestern Tasmania and marketed as a package containing geology, structure and mineral deposit locations.

### ***Project Generation — Central Arthur Project***

A potentially resource-rich, but poorly known area of the Arthur Lineament was covered by a detailed helicopter-borne aeromagnetic and radiometric survey in 1993/94. Processed data from this survey were released in April, together with two 1:50 000 scale digital geological maps covering an area from Savage River to Milabena. All data sources, including recent geological survey mapping, open file company reports and the aerial geophysical data produced for the project, were used in the compilation of the maps, which demonstrate continuity of prospective geological horizons and structures from Savage River northeast to the Arthur River and beyond.

## **EASTERN TASMANIA REGION**

### ***Exploration Activity***

The success of the NETGOLD project has been underscored by the resurgence of exploration interest and ground held in northeast Tasmania. At 30 June 1995, 2951 km<sup>2</sup> of the area was covered by exploration licences for gold, an increase of 329% from that prior to the project. A number of the companies are new to the State.

Active exploration is proceeding, with drilling programs expected to commence on several licences early in 1995/96. Encouraging geochemical results have been reported from the Lisle area by Macmin NL. A number of very competitive tenders were received for a 30 km<sup>2</sup> area near Lefroy, which was awarded to Central Kalgoorlie Goldmines NL.

In addition to the gold exploration programs, a number of other companies are active in the area:—

- Mancala Pty Ltd is exploring for tin in the St Helens area;
- The Merrywood Coal Company has applied for a licence to explore for tin and copper near Scamander;
- Mineral Holdings Australia Pty Ltd has applied for an exploration licence for alluvial tin in Ringarooma Bay;

- CRA Exploration Pty Ltd is searching for nickel in the Andersons Creek area near Beaconsfield;
- Stornoway Hewitt Pty Ltd is applying for a retention licence in the Waterhouse area for silica sand;
- Tasmanian Hardrock Pty Ltd hold a licence near Bell Bay with the aim of establishing a rock quarry for export of aggregate.

### ***Data Conversion***

Five 1:25 000 scale digital geological maps (Low Head, Weymouth, Retreat, Bowood and Nabowla) covering old gold producing areas, together with accompanying data on mineral deposit locations, structure, and locations of stream-sediment and rock-geochemical samples and drill holes, were compiled.

## **PROMOTION OF WESTERN AND EASTERN REGIONS**

A promotional visit was undertaken by a three staff, visiting thirteen mining and exploration companies in Melbourne, Sydney and Brisbane over four days. Although the companies varied widely in size and industrial interests, some broad conclusions could be drawn:—

- Gold remains the major exploration target, but there is re-awakening interest in some base metals;
- There was strong support for the concept of the State promoting its opportunities to business;
- There was praise for the quality of the digital geological maps and other data provided by the Tasmanian Geological Survey, and;
- There was appreciation of the efforts of Government to establish an improved business climate in the State, particularly through the *Mining (Strategic Prospectivity Zones) Act 1993*.

There are still some pockets of concern regarding security of access to land for mineral exploration and development in parts of the State. The promotional visits are of great value in providing a forum to address these concerns by face-to-face meetings with senior company management.

In conjunction with the General Manager — Mining and Mineral Processing of TDR, a presentation was made to economic attachés of the embassies of Japan, Canada, South Africa and the United States of America in Canberra, at a meeting hosted by Mr Shigeki Sakurai, Managing Director Australia of the Metal Mining Agency of Japan.

A delegation of four people from the Minerals and Energy Policy Centre of South Africa and a South African Member of Parliament was provided with information regarding the regulation and promotion of mineral exploration and the ownership of minerals in Tasmania.

# Engineering Geology and Groundwater

The main work of the Engineering Geology and Groundwater Section for the year comprised:-

- Land stability problems;
- Waste disposal and impacts on groundwater quality;
- Completion of a drilling program in the Oatlands area for groundwater resource assessments;
- Collection of groundwater data from bores in the northeastern and central eastern parts of the State, and;
- Compilation of urban mapping results for the Launceston area.

Time has also been spent on groundwater monitoring, construction materials, and the State of the Environment report.

## *Land Stability*

Many sites and areas of land proposed for development were assessed for landslide risk. These covered a wide area of the State but with the majority of the work being undertaken along the North West Coast. Advice was given to Telecom on possible stability problems associated with optic fibre cable routes from Glenorchy to Collinsvale and Koonya to Nubeena.

Holes were drilled around a house at Beach Road, Legana, to help determine whether damage sustained was the result of landslide or some other cause. The area continues to be monitored.

Some field work on the regional landslide survey of the North West Coast was undertaken during the year. This work was centered mainly around Burnie and the area to the south.

Groundwater levels in the Rosetta landslide continue to be monitored and the section advises the Glenorchy City Council on geotechnical matters associated with the area. A contract surveyor continues to undertake surveys to monitor movement of a number of landslide areas in the north of the state.

## *Groundwater*

The extended dry period over the summer resulted in a large number of enquiries from property owners regarding groundwater prospects.

A contractor drilled fourteen holes in the Oatlands area to complete an assessment of groundwater resources of the area. A number of these bores were capable of supplying small irrigation quantities of water, and pump tests were undertaken on the higher-yielding holes.

Groundwater quality protection has developed into a major function of the section, with a large proportion of the work being undertaken in association with the Division of Environmental Management of the Department of Environment and Land Management. Tip sites, disposal of sewage effluent by land irrigation, effects of septic tanks on groundwater quality, dairy effluent disposal, petrol leakages from service stations, and factory waste disposal have been the main problems dealt with in this field.

Monitoring of groundwater in the Devonport-Port Sorell-Sassafras region, an area of high groundwater use, continued and water samples were taken from a number of bores for chemical analysis. The regional monitoring bores around the State were visited twice for collection of water level data and water samples for chemical analysis.

Water samples and standing water levels information were collected from holes installed by the Australian Geological Survey Organisation for deep seismic studies. Lines of holes were established along the Pieman Road and Cradle

Mountain Link Road, and in the Mathinna, Ross and Osterley areas. Chemical analyses are to be conducted on the samples.

Groundwater data have been collected in the northeast and central east of the State for compilation on a scale of 1:250 000. This work has included the more accurate location of private contractors bores, water level and conductivity measurements, as well as any other relevant data.

Enquiries regarding mineral water sources are becoming more common as the demand for bottled water increases.

Information to support an application for funds to study groundwater resources in the drought-declared areas of southeast and eastern Tasmania was prepared, and information for a detailed study of groundwater quality in the Devonport area by AGSO was submitted. This study will include the effects of agricultural chemicals on groundwater quality, and the results should be applicable to other parts of the State.

### ***Urban Mapping***

Compilation of information for the Launceston area was almost completed during the year. Some results have been made available to one of the councils.

### ***Construction Materials***

Gravel resources have been examined in the Calder area, where the subdivision of rural land has been proposed. In some areas of the State there is pressure to subdivide land with significant resources and it is important that these resources are available for future extraction when material in other areas become depleted. In many cases approval to subdivide will prevent these resources being used.

### ***General***

The section made a submission on the subjects of groundwater and land stability to the State of the Environment report. Geological information for local government planning schemes was prepared for a number of municipalities.

A conference on geomechanics, held in Portugal, was attended by one section member, and a symposium on water resources in Adelaide was attended by another. Interstate meetings on groundwater management, issues for groundwater research, and of the National Groundwater Committee were also attended.

## **Geophysics**

The major project for the year has been the National Geoscience Mapping Accord (NGMA) TASGO Project. This joint State-Commonwealth project included the acquisition of seismic reflection, refraction, and tomographic data, aeromagnetic data and gravity data. In addition to a circumnavigation of the state by the research vessel *Rig Seismic*, seismic reflection traverses were recorded along the Pieman Road, the Cradle Mountain Link Road, the Upper Esk–Mathinna road, and in the Tunbridge and Osterley areas.

Aeromagnetic data were acquired around the north, west and south coasts of Tasmania with coverage extending to include King Island. Although the data have only undergone preliminary processing, the relationship between mainland Tasmanian geology and that of the surrounding areas has been greatly clarified.

Gravity data were collected at a 120 metre nominal spacing along the seismic reflection traverses. These data were levelled using accurate GPS methods and are in excellent agreement with existing conventionally-surveyed data.

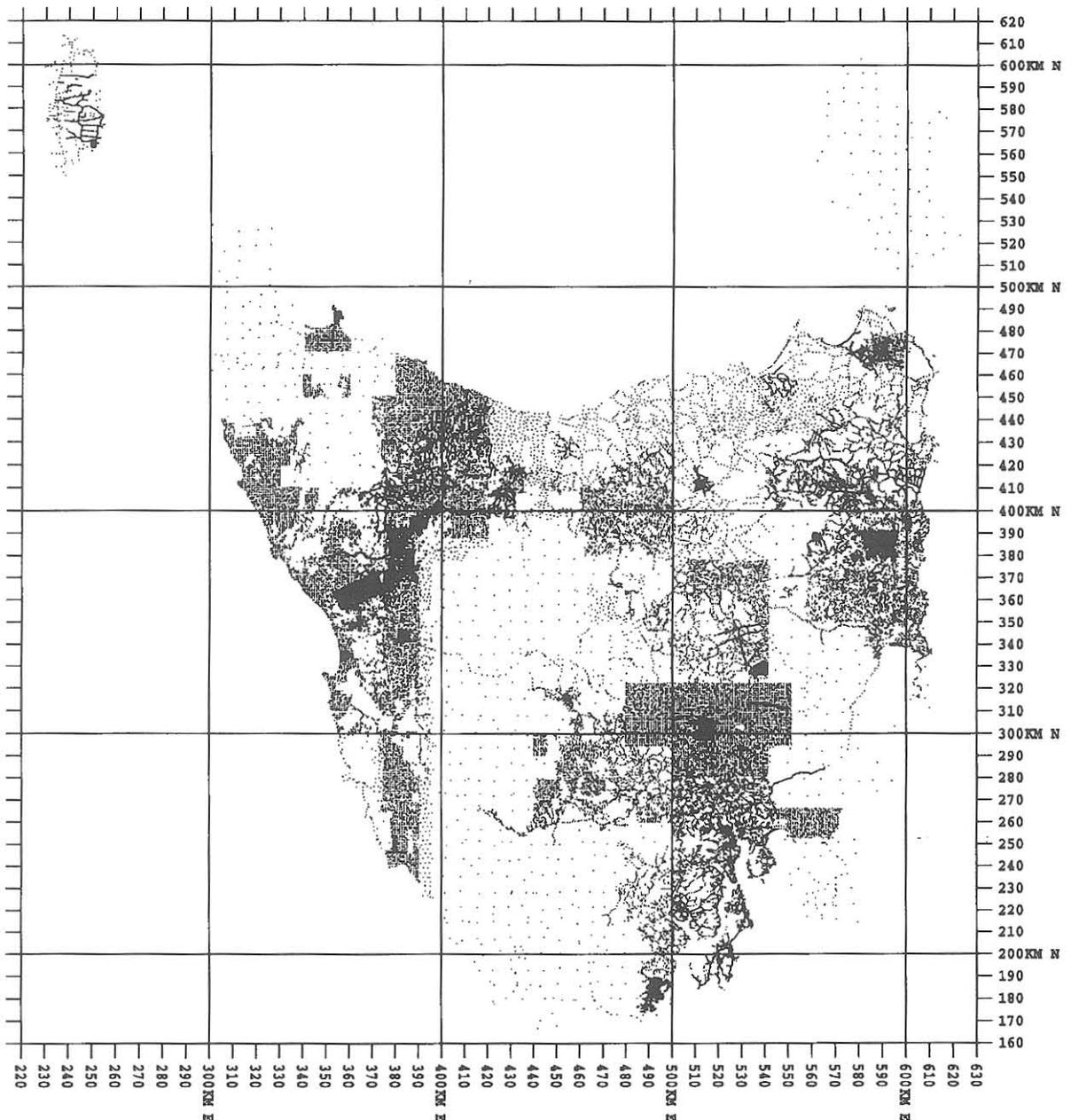
## Gravity-Magnetics

Apart from work associated with the NGMA project only one small gravity project was undertaken. This was a detailed survey in the Launceston City area which showed the presence of steep-sided structures filled with large thicknesses of low density, partially consolidated materials. These can be correlated with known landslide problems in some areas. Additional work is required to complete the coverage.

New helicopter-borne aeromagnetic and radiometric data from the Arthur Lineament were integrated with existing AGSO and TDR coverages, and an interpretation of the geophysical data in the Balfour-Waratah area was produced. Images of the central Arthur area were produced for the April 1995 data release.

Some specialist processing was undertaken for private companies, including integration of some recently rediscovered company data with the 1985 Southwest Tasmania aeromagnetic survey. Magnetic maps of the state are scheduled for production and release early in 1996.

### DISTRIBUTION OF TASMANIAN GRAVITY STATIONS AS AT 30 JUNE 1995



## *Computing*

Demand for computing resources has increased rapidly throughout the year. With the almost universal use of GPS navigation for airborne surveys, data volumes have increased greatly and modern re-processing techniques require that original data be readily accessible and may easily double in volume.

Further developments of the equivalent source technique for the vertical continuation of gravity data are being investigated. Work this year included the development of software for spatial sub-sampling to speed the convergence of the equivalent source calculation.

## *General*

Other significant tasks undertaken included:–

- Input on planning issues (e.g. the Public Land Use Commission);
- Preparation of satellite images of Macquarie Island;
- Assistance with the first stage of the TIGER project;
- Supervision and indexing of TASXPLORE, and;
- Gravity continuation of the Oatlands area.

## **Laboratory Services**

Service work for the Geological Survey and the Workplace Safety Inspectorate continues to be the major activity of Laboratory Services. Water, Huminex and other mineral analyses for external clients accounted for 18% of the laboratory activities.

The CPM-based computer for the x-ray fluorescence spectrometer failed during the year. Because of the difficulty in obtaining service for a near-obsolete operating system, the decision was taken to convert to the Philips DOS-based software. Further upgrading of the software and hardware is planned for 1995/96 to better meet the rising demands being placed upon our ageing system.

Development work on the determination of gold in river waters at the part per trillion level is proceeding well and a standard technique should be in place in the near future.

In total, 996 samples, which required 8964 individual determinations, were processed during the year. These samples comprised 836 water, 65 rocks and 95 minerals and products.

## **Petrology/ Mineralogy**

There were 571 non-Geological Survey samples received for investigation, including 178 samples for the CODES under an in-kind agreement, 31 for Mines Inspection, and 362 samples for paying customers. Revenue generated was \$19,642 from a wide range of external sources, including the Hydro-Electric Commission, Transport & Works and various other Government departments; various mining, mineral processing and exploration companies; and the general public and miscellaneous businesses. CODES also made use of our photomicrographic equipment.

Samples studied include geological materials (clays, mineral concentrates, rocks, soils, sands, and ore samples) and anthropogenic materials (asbestos, industrial materials, dusts, etc.). Quartz-bearing dusts, asbestos, and other environmental hazards are still very important, with 185 such samples being described and/or identified or tested.

Mines inspection work completed included coal ash analyses for Australian Paper at Burnie, analyses of dust from Launceston, and asbestos studies (fibre counting and identification) of samples from Branxholm and Launceston.

Departmental studies included samples from Anio Creek, various goldfields in the northeast and southeast, Glovers Bluff, Precambrian dolerite, possible petroleum source rocks, and core samples from a drill hole on Bruny Island.

Considerable petrological work has been undertaken as a part of the Tasmanian alkali-aggregate reactivity research project (TAARRP) in conjunction with the HEC, DRT, Concrete Institute and various companies. Some of the work has been produced as consultant reports, and most of the costs are being covered by individual sponsors. The project is investigating the concrete and aggregate used in major structures (bridges, dams, etc.) in Tasmania, in regard to the form of deterioration known as alkali-aggregate reactivity.

### ***Gold***

Investigations and promotional activities on gold deposits in various parts of Tasmania continue. In northeast Tasmania short trips were undertaken to the St Patricks River, Mangana, Alberton, Lisle and Beaconsfield areas. Joint studies with University of Tasmania staff (using ESR and PIXE probe for discrimination of gold-bearing quartz) are underway, as are miscellaneous studies on igneous petrology, geochronology and drilling in the goldfields.

Investigations were conducted in the southeast of the State into gold prospects at Cygnet, Dover, Pelverata and Kettering, and will continue into the next financial year as part of the Central Tasmania project.

A talk on the mineralogy of gold in Tasmania was presented at the National Mineralogical Symposium, held in Hobart in June.

### ***Data Bases***

The MIRLOCH data base of mineral deposits in Tasmania now has 3500 entries, covering coal, metallic and industrial minerals, and includes 1450 gold-bearing deposits. It is being updated steadily and most of the State is now well covered.

A Tasmanian minerals data base is being set up on Access, and the TASROCK data base of rock samples is being maintained.

### ***Miscellaneous***

The petrologist convened a symposium on the *Mines and Minerals of Tasmania* at the National Mineralogical Symposium in Hobart, and ran a week-long field trip in conjunction with the symposium.

Other resource investigations included compilation of statistics on industrial minerals, production of a report on clay in Tasmania, and compilation of data on sapphires, diamonds, rare earth elements and other commodities in Tasmania.

Curatorial work has included the updating of data bases, preparation of displays and posters, and supervision of the rock store. Contributions were made to the fossicking area report and a report on mining history. The petrologist attended a two-week geochemistry course at CODES.

### ***Petrology Laboratories***

The lapidary laboratories prepared 183 standard thin sections, 141 polished thin sections, and 26 large sections, making a total throughput of 350 samples. Most of these were done on a part-time basis by a field assistant.

The technical officer for petrological services processed 595 samples by x-ray diffraction, including 109 quantitative dust analyses and 44 quantitative clay analyses. He also conducted 37 soil tests and 66 optical asbestos identifications, for a total of 595 samples processed.

The lapidary and petrology laboratories provided a total of \$39,218 worth of analyses and services to both Government and external clients.

## Hydrocarbons and Tenement Management

This Section is responsible for the following programs:—

- Promotion and registration of petroleum exploration in Tasmania and off-shore waters administered by the State;
- Administration of the *Mining Act 1929*, including the issuing of legal titles to mining tenements, collation and recording of statistics relating to mining production, and the demand and monitoring of the collection of fees and rentals;
- Setting and monitoring of standards for both the performance of exploration programs by private companies on licences throughout the state and the technical reporting of exploration records and case histories;
- Environmental control of exploration; and
- Management of mining heritage and land-access issues.

### ACTIVITIES

#### *Oil and gas exploration*

Two new offshore permits were granted for oil and gas exploration during the year. One permit was awarded to Globex Far East, who propose a work program costing \$27 million over the next six years. The other permit was awarded to Bass Strait Oil Company Pty Ltd and Otway Oil and Gas Pty Ltd, who plan to spend \$22 million on exploration over the life of the permit. The majority of the prospective acreage in the Bass Basin is now held under title, due in no small part to the successful promotion of the area.

An extensive seismic survey was made by Sagasco Resources Ltd over existing permits TRL/1, T18/P and T/25P to further delineate possible drilling targets. One application for surrender was received for permit T26/P held by Ansbachall Pty Ltd.

A report was commissioned to summarise previous exploration history and comment on the prospectivity of the area offshore from western Tasmania. The report, complete with 17 enclosures, annotated seismic lines and summary structure maps, is available for purchase. This report covers areas which will be progressively released over the next twelve months.

Onshore work continued by Condor Oil Pty Ltd, and subsequently by Great Southland Minerals Pty Ltd, on exploration licence EL1/88. Work commenced on the compilation of open file data relating to previous efforts to explore for oil in Tasmania. A number of rocks were submitted to CSIRO for analysis of their source rock potential. The results of this study will be presented in a bulletin, due to be published by the end of the 1995/96 financial year.

#### *Coal Industry*

The State's two coal producers continued to supply sufficient coal for the domestic market. Total coal consumption of 444 000 tonnes was 44 000 tonnes more than last year. This includes consumption of 125 000 tonnes of imported coal, compared to 62 000 tonnes last year.

#### *Registry Section*

The Registry Section maintains a number of registers and data bases, and also provides advice to TDR officers, inquirers from other agencies, the mining industry and the legal profession, on a wide range of matters associated with mining tenements and legislation.

Processing of applications for mining tenements and the issue of tenement documentation continues to provide the majority of work for the Section's officers. Major emphasis has been placed on implementation of the Government's "Use it or Lose it" policy, with failure to provide quarterly production reporting or nil production without adequate reason leading to formal cancellation of tenements.

The Registrar has provided major input into drafting of the *Mineral Resources Development Bill*, and represents the Agency on the ANZMEC Minerals Legislation Subcommittee.

Exploration expenditure, as reported by the Australian Bureau of Statistics for the first three quarters of the year, was \$9.7 million. This figure was \$2.6 million greater than the same period in the previous year.

Twenty Exploration Tender Areas (ETA) were offered to explorers. The ETA system uses facsimile to advise clients of new exploration opportunities as they become available.

There were 157 new Tasmanian Company Reports on mineral exploration received during the year, an increase of 25 over the previous year. Some 381 reports from exploration companies were microfilmed during the year. The open/closed file report library represents an irreplaceable resource of mineral exploration data. Proper custody of these records remains a priority.

### ***Court of Mines***

Tasmania is divided into four mining districts, each with a Warden of Mines. The Wardens, who are magistrates, hear disputes arising under the *Mining Act 1929*. Five cases were referred to the relevant Warden during the year. All cases were withdrawn before formal hearing.

### ***Environmental Management***

The appraisal and monitoring of mineral exploration programs continued with diligence and attention to detail. A third edition of the *Mineral Exploration Code of Practice* was released. The Code is something of a landmark document and has been widely praised by both Industry and Government sources. Regular field visits were made to ensure company operations were being conducted in an environmentally responsible manner.

An extensive rehabilitation project, started last year, continued at the former Rossarden and Storys Creek mines. Part of the bed of Storys Creek was straightened to improve water flow and reduce the erosion of mine tailings dumps. Two small wetland areas were constructed at the entrance to adits from which acid water, containing dissolved metals, was seeping. Further remedial work at Rossarden is planned, with vegetation trials being conducted prior to the implementation of larger scale revegetation works.

Plans were also made for the establishment of a Trust Fund for the remediation of abandoned mining lands. The funds for such work are anticipated to be generated by an increase in mining royalties. A committee, consisting of representatives from government agencies and industry bodies, has been established to oversee the administration of the Trust Fund. A list of sites to be considered for remediation will be collated by the committee.

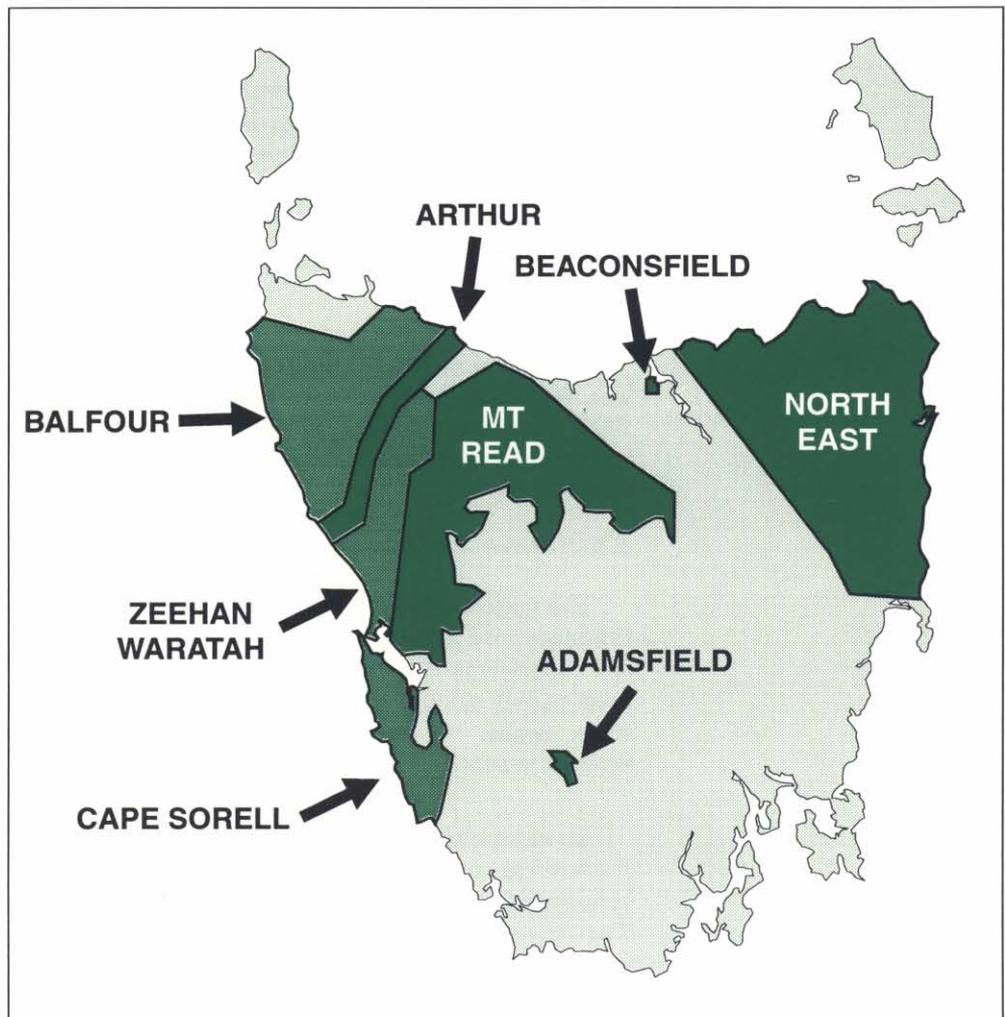
### ***Aboriginal Liaison***

A policy on protection of Aboriginal heritage and liaison with the Aboriginal community was released in November 1994.

### Strategic Prospectivity Zones

Strategic Prospectivity Zones (SPZ) cover 25 200 km<sup>2</sup>, or 37% of the State. The areas in each SPZ occupied by mining tenements at the end of June were:-

SPZ	Area (km) <sup>2</sup>		Area (km) <sup>2</sup>	
	Area (km) <sup>2</sup>	% Occupied	Area (km) <sup>2</sup>	% Occupied
		<i>Metallics</i>		<i>Non-Metallics</i>
Adamsfield	0.0	0.0	0.0	0.0
Arthur	613.5	54.4	25.3	2.3
Balfour	298.6	7.6	11.4	0.3
Beaconsfield	19.0	100	4.0	21.0
Cape Sorell	746.9	54	0.0	0.0
Mount Read	2292.5	31.9	0.0	0.0
North East	3130.2	32.1	432.0	4.4
Zeehan/Waratah	594.6	32.4	44.7	2.4



### Mining Heritage

An extensive archaeological assessment of the Rossarden/Storrs Creek areas was made by heritage consultants prior to the implementation of the proposed rehabilitation. This ensures that the engineering solutions proposed would not inadvertently destroy any feature of outstanding heritage significance. The areas earmarked for rehabilitation were surveyed and recorded, with the survey showing that the proposed works would not impact on any significant heritage values.

A brief assessment of the significance of the heritage values at the King mine at Lynchford was made by consultants from Godden Mackay Pty Ltd.

Guidelines on the recognition and importance of heritage values were produced for the information of field staff.

Reports were produced on the impact of a quarry proposal on the Valley Race at Derby; the King River gold mine; the Balfour Mining District; the Mt Cameron Water Race; the Queensberry mine at Zeehan; the Devonport mine at Black Bluff; and the Lyndhurst Goldfield, Waterhouse.

### *Lease Applications*

Sixty-six Mining Lease applications were received during 1994/95, including 44 on Crown Land and 22 on private property. There are 744 mining leases held for various mining products, compared to 788 in 1993/94.

### *Licence Applications*

Forty-two applications for Exploration Licences were received during 1994/95.

*Number and areas of leases and licences applied for during the year ended 30 June 1995*

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
All minerals ... ..	13	10 835	
Specimens ... ..	1	4	
Gold ... ..	2	299	
Granite ... ..	1	21	
Gravel ... ..	5	49	
Silica ... ..	1	11	
Sand ... ..	4	63	
Sandstone ... ..	1	1	
Sand and gravel ... ..	1	7	
Stone ... ..	15	383	
Lime sand ... ..	2	3	
Road easement ... ..	2	72	
Dam easement ... ..	3	27	
Tailing dam easement ...	11	1 010	
Water easement ... ..	2	16	2
<b>Total ... ..</b>	<b>64</b>	<b>12 801</b>	<b>2</b>

*Number and areas of leases and licences granted during the year ended 30 June 1995*

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluiceways</i>
All minerals ... ..	4	2 258	
Coal ... ..	1	4	
Gold ... ..	1	36	
Granite ... ..	1	21	
Gravel ... ..	3	10	
Quartzite ... ..	1	219	
Sand ... ..	3	67	
Sand and gravel ... ..	1	91	
Sand and stone ... ..	1	5	
Sandstone ... ..	1	1	
Silica sand ... ..	1	11	
Specimens ... ..	1	4	
Stone ... ..	38	465	
Stone and gravel ... ..	1	7	
Water easement ... ..	3	16	8
Housing easement ... ..	1	9	
Pipeline easement ... ..	1	2	
Road easement ... ..	2	72	
Dam easement ... ..	3	27	
<b>Total ... ..</b>	<b>68</b>	<b>3 325</b>	<b>8</b>

Total number of leases and  
licences in force  
on 30 June 1995

<i>Principal Product</i>	<i>Number</i>	<i>Area (ha)</i>	<i>Sluicheads</i>
All minerals ... ..	59	30 025	
Clay ... ..	9	180	
Coal ... ..	13	6 600	
Copper ... ..	2	8	
Dolerite... ..	1	2	
Dolomite ... ..	4	141	
Gold ... ..	30	1 572	
Easements ... ..	42	337	196
Granite ... ..	7	63	
Gravel ... ..	145	3 377	
Iron ... ..	1	1 959	
Kaolin ... ..	2	373	
Lime sand ... ..	2	3	
Limestone ... ..	10	1 210	
Magnesite, silica and talc	1	29	
Peat ... ..	5	772	
Quartzite ... ..	1	219	
Sand ... ..	58	1 863	
Sand and gravel... ..	27	2 952	
Sand and stone ... ..	8	157	
Sandstone ... ..	4	49	
Savage River easements ...	12	2 248	
Shale ... ..	4	39	
Silica ... ..	15	1 141	
Silver and lead ... ..	1	8	
Slate ... ..	5	186	
Specimens ... ..	3	19	
Stone ... ..	258	7 529	
Stone and gravel ... ..	8	498	
Tin ... ..	26	6 407	
<b>Total ... ..</b>	<b>763</b>	<b>69 966</b>	<b>196</b>

Total number of all types  
of prospecting rights held  
as at 30 June 1995

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Exploration Licences — All minerals	129	8077 km <sup>2</sup>
Non metallic	4	93 km <sup>2</sup>
Oil	3	3478 km <sup>2</sup>
Retention Licences — All minerals	13	76 km <sup>2</sup>
Non metallic	14	392 km <sup>2</sup>
Prospectors Licences	17	387 ha
Miners Rights	2	5 ha
Owners Rights	1	1005 ha
Permits to explore for Petroleum under <i>Petroleum (Submerged Lands) Act 1967</i>	5	390 Blocks
Retention Licence under <i>Petroleum(Submerged Lands) Act 1967</i>	1	9 Blocks

## Data Management

This Section is responsible for:–

- Geoscientific data management;
- Tenement management services;
- Management of the Geographic Information System;
- Management of the Computer-Aided Drafting System;
- Provision of support drafting services.

To achieve the outcomes of increased and more effective mineral investment in Tasmania, the Section ensures that:–

- The Data Management Group sets standards of excellence in data storage, presentation and achievement so as to ensure Tasmania remains competitive as a mineral province;
- The recording of mining tenements on the Division's maps and plans is carried out efficiently and accurately;
- The Division's map library of Commonwealth and State Land Information data sets is accurately maintained, as well as maintaining an awareness of State and national land information issues;
- The implementation, maintenance and quality control of the Geographic Information System and Computer-Aided Drafting system are of the highest standard;
- The capture and output of spatial data on the Geographic Information System and output from the Computer-Aided Drafting system is carried out within specific time frames and programs;
- Technologies, as required by the Section, are implemented and developed;
- Data Management Section information and services are efficiently provided to clients;
- Proper training is provided for staff.

The Agency's GIS continues to be developed to meet the requirements of our clients. This development was enhanced by a software upgrade and the increased knowledge of staff involved in GIS.

The receipt of the 'Best Project Display' award at the Arc/Info users annual national conference held in Hobart in September 1994, and a Government Technology Productivity Gold Award for the production of the NETGOLD maps, was further recognition of our work using this technology.

During 1994/95 one geological map, the 1:100 000 scale *North East Tasmania Groundwater Resource Project – Lilydale*, was printed.

Production of the Trowutta 1:50 000 scale geological map was commenced by the Land Information Bureau of the Department of Environment and Land Management. This is the first map to be produced under the Government's centralised mapping policy.

### ***Computer-Assisted Drafting (CAD)***

CAD continues to be used as a support tool for many projects. The capture of geological data continued during 1994/95, resulting in:-

- the completion of the 1:250 000 scale digital geology of Southeast Tasmania project;
- the completion of the 1:250 000 scale digital geology of Northwest Tasmania project;
- the completion of the Central Arthur digital geology project;
- the capture and output of five digital geological maps (Charter, Block, Tullah, Selina and Tyndall) at a scale of 1:25 000 in the Mount Read Volcanics region;
- the capture and output of another five digital geological maps (Low Head, Weymouth, Retreat, Bowood and Nabowla) at a scale of 1:25 000 in northeast Tasmania;
- the creation of GIS data sets, covering the above project areas, of other data bases relative to mineral deposits, drill hole locations, stream-sediment geochemistry locations and rock-chemical analysis sample locations;

Output maps, plotted on the Agency's HP 650C inkjet jet plotter, of the above digital geological data are produced on demand.

During the year a trainee commenced work within the section, the first trainee to be appointed in the drafting/cartographic areas of the Agency in eighteen years.

# MINES INSPECTION

The Chief Inspector of Mines has responsibility for managing the following issues:-

- Monitoring ambient work environments and systems of operations at mines (including quarries and mineral processing sites) to ensure the health and safety of employees and others who may otherwise be affected by the work carried on;
- Assisting with the processing of mining lease applications, renewals, transfers and surrenders;
- Ensuring that equitable returns are received for resources mined, by monitoring production returns;
- Ensuring that mining operations are conducted in an environmentally acceptable manner; and
- Liaising with the Department of Environment and Land Management, Forestry Tasmania, and municipal authorities on land planning issues.

## Mines Inspectorate GENERAL

The Mines Inspectorate staffing complement remained unchanged during the year, consisting of three mining engineers, a metallurgist, an electrical engineer, a mechanical engineer and two technical officers. There was no turnover of staff.

One of the mining engineers was assigned to the Managing Geologist, Hydrocarbons and Tenements for land use purposes, with a principal responsibility for co-ordinating the rehabilitation of abandoned mine sites. He retains a health and safety responsibility and is the inspector for the collieries. The two technical officers, who carry out health and safety inspections in the North and North West, in addition to having lease processing and environmental control responsibilities, report directly to this engineer.

At year end, the Mechanical Engineer was promoted in an acting capacity to that of Chief Inspector of General Industry. The Mechanical Engineer was instrumental in developing the Tasmanian Safety Audit System, which was successfully introduced as a self-audit to larger mines to determine the winner of the annual major safety award for 1993/94.

## FUNCTIONS OF THE MINES INSPECTORATE

Traditionally, the Inspectorate has applied the *Mines Inspection Act 1968* and supporting regulations to the infrastructure and systems of operation of the various enterprises comprising the mining industry, in the interests of providing hazard-free environments for all persons who may be affected by those infrastructures or operations. Assistance is given with the application of the *Dangerous Goods Act 1976*, the *Environment Protection Act 1973*, and the *Mining Act 1929*.

On mine sites, the *Dangerous Goods Act 1973* is applicable to the manner in which dangerous goods are stored. The manufacture of explosives is also subject to provisions of this Act.

The Inspectorate has considerable responsibility for emissions from mine sites of excessive noise and substances injurious to health or safety, or which may cause degradation of the environment. These concerns are legislated for in the *Environment Protection Act 1973* and are controlled by ensuring, as far as reasonably practicable, that excessive noise is attenuated, harmful dust and gas are contained, tailings dams are made secure, water pollutants are neutralised, and contaminated run-off is settled. Many of these precautions are spin-offs of measures taken in the interest of the health and safety of persons engaged in operations at the mines.

Rehabilitation of areas disturbed by mining are effected with input from the Inspectorate in conjunction with members of the Division of Environmental Management of the Department of Environment and Land Management. Provisions of the *Mining Act 1929* with regard to mining leases, prospecting licences, miner's rights, water licences and easements are administered by the Section. Realistic bonds are set for the rehabilitation of disturbed areas on the completion of mining.

The Inspectorate examines plans and proposals for the operation of mines, plant and equipment. It offers advice on best practices as required and issues approvals as appropriate.

## ENVIRONMENTAL CONTROL MEASURES

Joint inspections of mine sites, both operating and abandoned, by the Inspectorate and members of the Division of Environmental Management are frequently conducted. An annual joint inspection of one of the major mines to monitor rehabilitation progress has been carried out for many years. This practice is to be extended to a further two mines in the coming year.

A mining policy document, for internal use, is currently being drafted with the assistance of the Division of Environmental Management. This document will contain procedures to be followed with regards to acid rock drainage and toxic tailings discharge.

It is now anticipated that the *Environmental Management and Pollution Control Act* will be proclaimed in October 1995. It has been agreed by the Secretary of the Department of Environment and Land Management that inspectors of mines will be authorised as officers under the Act.

## THE QUARRY CODE OF PRACTICE

The *Quarry Code of Practice* was drafted, in partnership with the Division of Environmental Management of the Department of Environment and Land Management and industry organisations, in order to provide relevant information for small operations. It will assist municipal councils in administering planning applications and managing the environmental effects of quarrying, and provide advice for operators of small-scale pits.

Subjects covered by the Code include legislation, site selection and planning, safety, environmental management, drainage, erosion and rehabilitation. Site planning is particularly important and can minimise the environmental impacts and complaints.

The Code incorporates bottom line environmental standards and suggests measures for operators to improve their environmental performance above these minimum requirements, and provides for a uniform minimum standard of operation across the industry.

The Code was launched at Perth in February by the Minister for the Environment, and was subsequently presented to interested parties at Sorell, Huonville, Wynyard and Scottsdale.

## WORKPLACE HEALTH AND SAFETY ACT

The *Workplace Health and Safety Act 1995* was proclaimed on the 16 August 1995.

The Act provides for certain workplaces, or classes of workplace, to be "designated" by the Director of Industry Safety if the nature of the work carried out is considered to be hazardous or is likely to become hazardous. It has been decided that as all mines, including quarries, mineral processing plants and Exploration Licence tenements are in this category, they are to be deemed as "designated workplaces".

The Act, which focuses on the duty of care of the employer and all employees, contractors and their employees, and any other persons engaged in the operations at a workplace, requires that the employer appoint a "responsible officer" to carry out his or her duties under the Act at the workplace.

In the case of designated workplaces, it is a requirement that the employer notify the Director of Industry Safety of the name of the appointed responsible officer. With regards to mines, it is proposed that the Workplace Health and Safety Regulations, which are in the process of being drafted, define the responsible officer as "the manager". The manager will be registered by the Department and hence become known as "the Registered Manager".

The Act makes provision for the prescription of qualifications of responsible officers. In the event that the qualifications of the officer do not meet those prescribed, he or she must employ someone with the relevant qualifications. The specification of qualifications in this context will only apply to underground mines and surface mines employing more than a stipulated number of persons, either underground or in an open cut. The qualification referred to is a Mine Manager's Certificate of Competency.

Another requirement of the Act, with regard to designated workplaces, is that the responsible officer must keep a record book if required to do so by the Director of Industry Safety.

The proclamation of the *Workplace Health and Safety Act 1995* had the effect of repealing the *Mines Inspection Act 1968*. The *Mines Inspection Regulations 1991* will remain in force until the new Workplace Health and Safety Regulations and attendant Codes of Practice are promulgated. It is intended that the *Mines Inspection Regulations 1991* will be redrafted to form a Mining Code of Practice.

## MINE MANAGERS CERTIFICATES OF COMPETENCY

The following Mine Managers Certificates of Competency were issued by the Board of Examiners in accordance with the provisions of the *Mines Inspection Act 1968* and the *Mutual Recognition Act*.

No.	Name	Mine
350/93	John Campbell Davidson	Copper Mines of Tasmania
351/94	Johanne Geradus Las	Industry Safety and Mines
352/94	Timothy Purvis	Pasminco, Rosebery
353/94	Alasdair William Martin	Pasminco, Rosebery
354/94	Stuart Leslie Gula	Anchor Tin
355/95	Richard James Scallan	Renison Tin
356/95	Richard Anthony Potts	Pasminco, Rosebery
357/95	John Lorden Moss	Pasminco, Rosebery

## NATIONAL UNIFORMITY

The *Handbook for Safe Mining* is ready for printing. This book was commissioned by the Australian and New Zealand Energy Council and relied heavily on input from industry, unions and inspectorates. ANZMEC have directed that printing should go ahead as soon as possible. The handbook will have no legal status but will serve as a useful reference publication.

The issue of portable professional qualifications for quarry managers has received a considerable amount of attention during the past year. A discussion document was fully explored at a combined meeting of Chief Inspectors of Mines and members of the Institute of Quarrying, where the Institute offered to put forward a proposal regarding their certification of quarry managers. The proposal was subsequently submitted and is being considered by the Conference of Chief Inspectors of Mines.

## SAFETY PERFORMANCE AND ACCIDENTS

The Premier of Tasmania presented the employees of The Cornwall Coal Company No Liability with a *Special Achievement Award* for 365 lost-time injury free shifts, achieved in May 1994. No enterprise has since accomplished this achievement.

For comparison of safety performances between enterprises and for measuring improvement within an enterprise, the lost-time injury frequency rate (LTIFR) is used as the key performance indicator (KPI). This KPI is also used for comparing the average performances between States (including the Northern Territory).

The average LTIFR for Tasmania for 1994/95 was 27.0, a slight improvement over the LTIFR of 33.1 in the previous year. The average LTIFR for all Australian States and the Northern Territory in 1993/94 was 27.

## OCCUPATIONAL HEALTH AND SAFETY SEMINAR

The 1994 MRT (ISM)/Tasmanian Minerals Council Occupational Health and Safety Seminar was held at the Launceston Country Club Casino in September. The theme of the Seminar was "Accident Prevention Through Cultural Change". The Seminar was attended by approximately 180 people from the mining and other industries.

During the course of the Seminar, the Intermine Safety Competition awards for 1993/94 were presented by the Minister for Mines to:-

- Renison Tin — for the major contribution to mining industry safety;
- Cornwall Coal — as the safest underground mine;
- Tioxide — as the safest large surface operation; and
- Circular Head Dolomite — as the safest small surface operation.

For the first time, the major award was based on a self-audit of each of the large mines' safety management system.

## MINEX AWARDS

The Inspector of Mines (Mechanical) was an evaluator for the inaugural National Mine Safety Competition run by the Minerals Council of Australia. This competition is decided on the basis of an evaluation of management systems with reference to a cycle of improvement built on the IADRI framework. (The **Intent** of the management; the **Approach** to achieving excellence in safety management; the effective **Deployment** of resources; the measurement of **Results**; and the review processes leading to further **Improvement**).

No Tasmanian companies participated.

## MINE RESCUE COMPETITION

The Annual Intermine Safety Competition was held at Renison on 15 October 1994. Six Tasmanian teams competed, while a team from the Emperor Gold mine in Fiji participated in some of the events to gain experience.

An all-female team, the Renison 'Green' team, entered the competition for the first time. This was one of two teams representing Renison.

The Renison 'Blue' team won seven of the eight awards, including that of overall winner. The Mt Lyell team was awarded the trophy for the first aid practical event.

## SERIOUS ACCIDENTS

### *Fatal Accident*

- A jumbo operator at Renison Tin Limited died as the result of asphyxiation when his clothing became entangled around the drill steel of a drifter while it was under full rotation and percussion.

### *Falls*

- A contractor's employee suffered extensive bruising when he fell approximately seven metres down a stripping shaft onto a grizzly covering the pilot raisebore hole. His fall was retarded by the knocker line in his grasp.
- An operator at a processing plant fractured an ankle when he jumped from a ladder.
- While lifting gear, a rigger fell three metres from the top of a cyclone and suffered a broken wrist, jarred back and neck, and concussion.

### *Falling Objects*

- A falling rock knocked a jumbo drill operator unconscious as he was approaching the face after shutting the machine down.
- An operator was struck on the shoulder by a falling rock while proceeding to mark up a face following mechanical and check scaling. He suffered severe bruising and swelling.
- A raiseboring contractor's employee was struck by a falling rock after retreating some distance from a raisebore hole which was being reamed. He suffered neck and back injuries.

### *Stepping On, Struck By, Struck Against*

- A contractor's employee at a mineral processing plant received a fractured ankle when a pipe rolled onto his foot.
- A contract painter at a mineral processing plant had a piece of wire lodged in his eye and eyelid when using a pneumatic wire brush while not wearing eye protection.
- A contract LHD operator received a serious eye injury when a fragment of steel, presumed to have splintered from the bucket of the LHD, entered his eye.
- A miner received severe injuries, resulting in the removal of his spleen, when struck by a loop in a runaway electric cable he was assisting in lowering down a 39 metre deep borehole.

### *Caught In*

- A forklift driver at a brickworks suffered a crushed hand when the forklift he had alighted from ran forwards, jamming his hand between its forks and a load of bricks.
- A contractor's employee received a broken arm, severe lacerations and skin loss when his hand was caught in the tail pulley of a conveyor at a stope fill plant.
- A contract driller jammed his fingers between a power wrench he was using and a shaft drilling head assembly, resulting in the amputation of the tip of one of his fingers.

### *Temperature*

- An operator at a refinery suffered burns to his legs and arms when hot liquid erupted from a tank while he was walking on the walkway above it.
- Two operators received burns to their legs on opening a boiler door at a refinery.

## Mining Industry Lost-Time Accident Statistics 1994/95

<i>Employer</i>	<i>Work-hours Exposure</i>	<i>No of Persons</i>	<i>No of Injuries</i>	<i>Days Lost</i>	<i>Frequency Rate</i>	<i>Severity Rate</i>
Aberfoyle – Hellyer	531 798	280	12	244	22.6	459
Beaconsfield Gold	42 989	15	3	11	69.8	256
Copper Mines of Tasmania	119 082	55	0	0	0	0
Henty	74 553	41	3	42	40.2	563
Mt Lyell	280 196	139	9	51	32.1	182
Pasminco, Rosebery	688 514	311	11	180	16.0	261
Renison Tin	806 508	347	3	281	3.7	348
Savage River	329 989	149	22	373	66.7	1 130
Tasmania Mines	40 390	20	3	26	74.3	644
<b>All Mines</b>	<b>2 914 019</b>	<b>1 357</b>	<b>66</b>	<b>1 208</b>	<b>22.6</b>	<b>415</b>
Comalco	1 528 930	833	40	290	26.2	190
Goliath Cement	489 887	231	4	11	8.2	22
Impact Fertilisers	96 447	46	1	57	10.4	591
K & D Brick	93 493	47	13	167	139.0	1 786
Mole Creek	43 502	25	1	241	23.0	5 540
Nubrick	86 634	47	1	2	11.5	23
Pasminco Metals-EZ	1 463 772	765	64	672	43.7	459
Port Latta	159 598	70	4	40	25.1	251
Riltec	23 818	1	1	13	42.0	126
Temco	810 572	450	18	230	22.2	284
Tioxide	487 883	248	9	26	18.4	53
Tonganah Clay	27 068	16	0	0	0	0
<b>All Works</b>	<b>5 311 604</b>	<b>2789</b>	<b>156</b>	<b>1 739</b>	<b>29.4</b>	<b>327</b>
Cornwall Coal	143 992	89	4	22	27.8	153
Merrywood Colliery	59 162	26	2	29	33.8	490
<b>All Collieries</b>	<b>203 154</b>	<b>115</b>	<b>6</b>	<b>51</b>	<b>29.5</b>	<b>251</b>
<b>All Quarries</b>	<b>327 261</b>	<b>162</b>	<b>8</b>	<b>288</b>	<b>24.4</b>	<b>880</b>
<b>TOTALS</b>	<b>8 756 038</b>	<b>4 423</b>	<b>236</b>	<b>3 286</b>	<b>27.0</b>	<b>375</b>

### DEFINITIONS

#### *Frequency Rate*

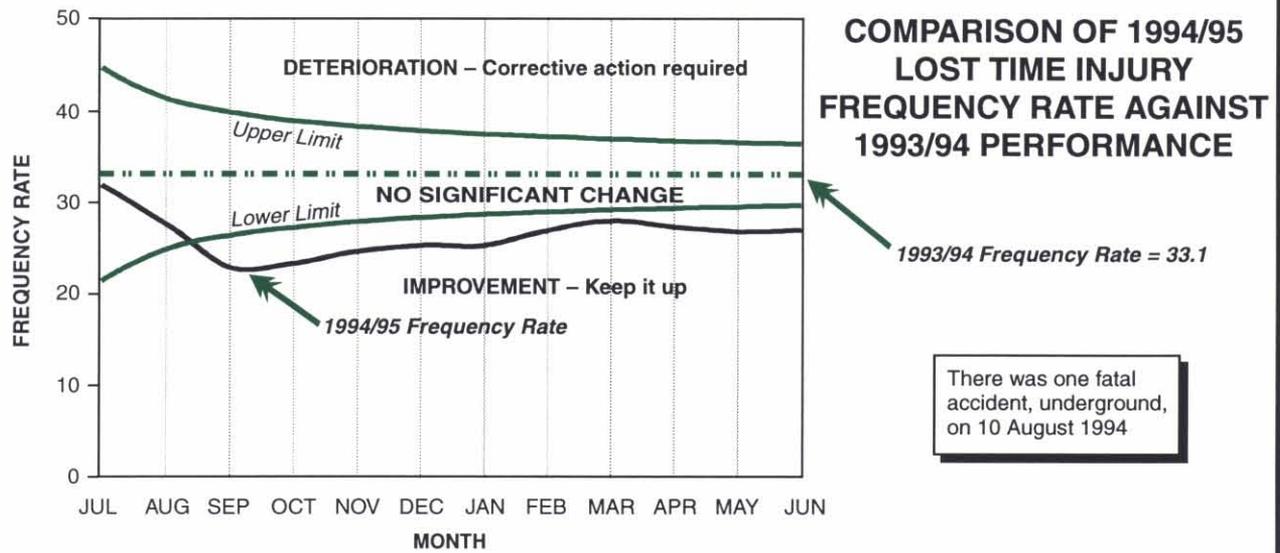
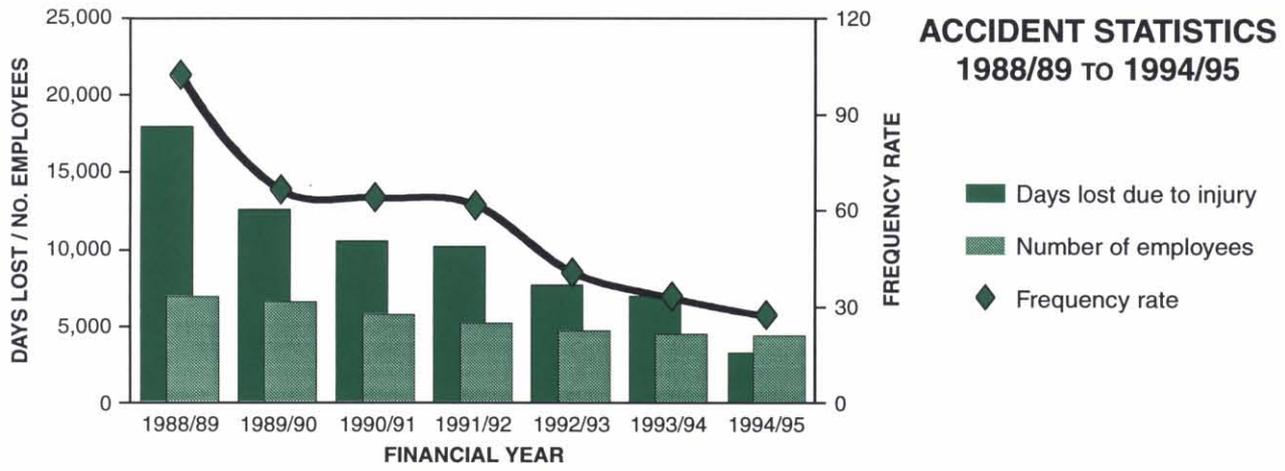
This is the number of lost-time injuries in the year related to a million work-hour unit, as follows:

$$\text{LTIF Rate} = \text{No. of lost-time injuries} \times 1,000,000 / \text{Work-hours exposure}$$

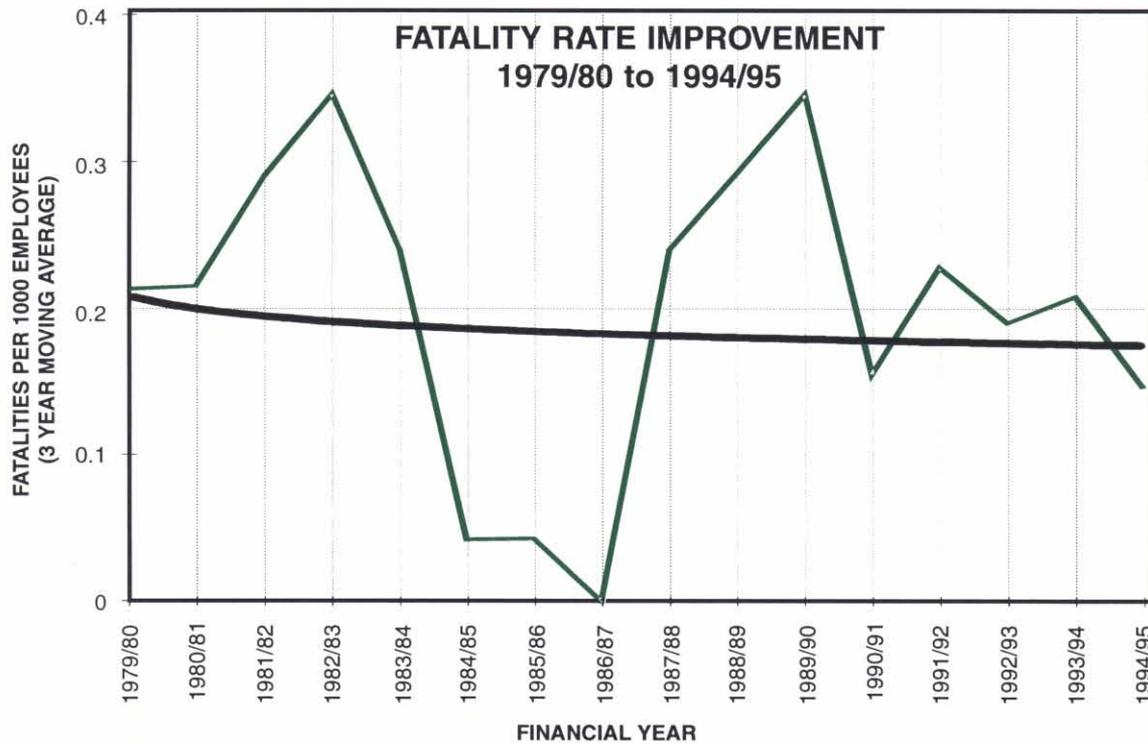
#### *Severity Rate*

$$\text{Severity Rate} = \text{Shifts lost} \times 1,000,000 / \text{Work-hours exposure}$$

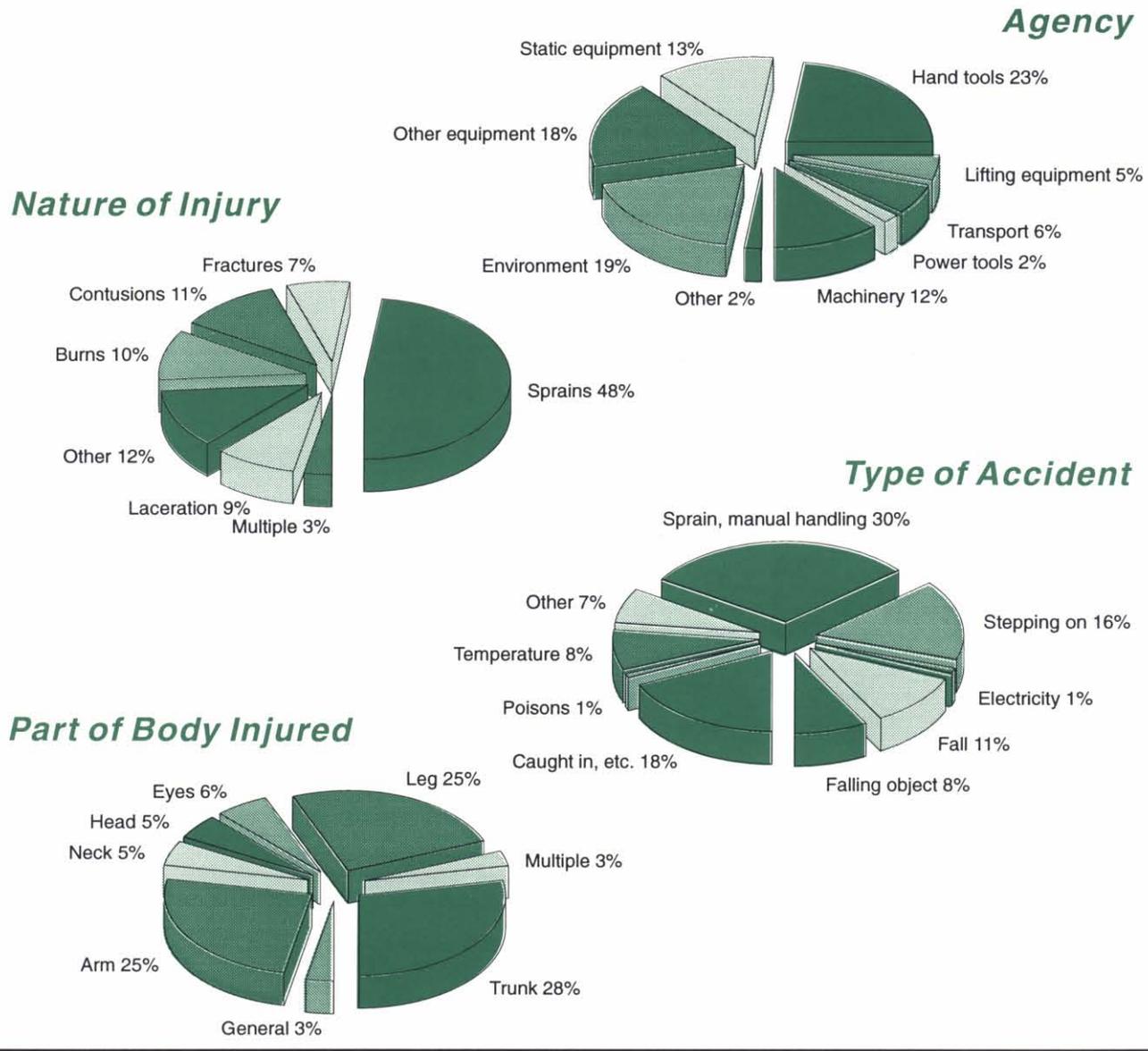
# MINING INDUSTRY ACCIDENT STATISTICS



There was one fatal accident, underground, on 10 August 1994



# MINE INJURY CLASSIFICATION, 1994/95 (Australian Standard AS1885-1976)

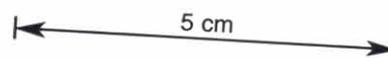


### ***Electricity***

- A contractor's employee received a severe electrical shock in an electrolytic refining plant area when kneeling on a floor of cell potential while attempting to remove an earthed lead shield.

### ***Gassings***

- An electrical contractor's employee was overcome by phosgene fumes from a refined metal casting area while working on the roof of a nearby building. He was admitted to hospital but later released.
- A lamination contractor's employee was overcome by fumes while fibreglassing inside a tank at a mineral processing plant. After a short period in hospital he was released.



## MECHANICAL INSPECTIONS

The following certificates of competency were issued:—

Mine Winder Drivers	6
Restricted Crane Drivers	52
Crane Drivers	<u>2</u>
	<u>60</u>

### *Machinery and Vehicles*

During the year the following approvals or rejections were issued.

Compression ignition engines for underground use	79
Cranes — approved	11
— referred back	2
— rejected	1
Shaft sinking and equipping systems	3
Emergency winder design	1
Mine winding installation	3
Modification to fork lift truck	1

- A new ventilation upcast shaft at Pasminco Mining's Rosebery mine is equipped with a winder, making use of the drum from the old Mary Ann winder fitted with a hydraulic drive. Control will be push-button automatic. The cage will travel in top-tensioned rope guides.
- An unbalanced cage-over-skip winding system is to be installed at the Henty mine.
- At Beaconsfield, a second-hand man-cum-rock winder is to be installed.
- A fully automatic single skip/counterweight Koëpe winder with push button over-ride for shaft inspection will be installed underground at Renison Tin. Emergency recovery will be by an auxiliary drive on the winder gearbox.
- Pasminco Metals-EZ has been liaising with the mechanical and electrical inspectors during the development of a new cathode stripping machine.

### *Significant Incidents*

- Failure of a crane rope in a tank farm area while the crane was carrying a load of approximately 10% of its rated load. The failure was attributed to rope damage caused by overloading on a previous occasion.
- A truck, carrying a load of float material, rolled over when descending a long haul road. The truck's braking system had not been maintained in a fully serviceable condition.
- An Elphinstone R1700 loader caught fire when a torque converter hose failed and sprayed hydraulic fluid onto the engine. The fire was extinguished using the on-board AFFF system and a hand-held dry powder extinguisher.
- An Elphinstone R1500 LHD ran away down a slight incline underground and collided with a light vehicle. It would appear that the driver of the LHD did not apply the park brake prior to alighting from the machine.
- A rope on a new 10 tonne serial hoist was seriously damaged during commissioning tests. The hoist had been incorrectly assembled at the factory, a mistake which could not be detected by inspection.
- Faulty rebuild procedures due to misleading drawings in the manufacturer's manuals led to the failure of an anchor hoist to hold a load of less than its rated load.

- A circlip on a hoist failed and allowed the pin holding the hook to partly come out. All hoists of this type were subsequently fitted with new circlips, and the overhaul procedure was changed to highlight the need to renew the circlip at each overhaul.
- A hoist dropped its load when the coupling between the motor/brake assembly and the hoist capstan failed. The problem was attributed to poor maintenance.
- An articulated truck cab rolled over while tipping a 'sticky' load on a level concrete surface. The driver was wearing a seatbelt and was not injured.

## ELECTRICAL INSPECTIONS

The Henty and Beaconsfield gold projects each commenced installation of production winders. Pasminco Rosebery installed an emergency personnel winder in a new exhaust shaft and plan to modernise two existing winders in 1996. Renison will commission a rock haulage winder in 1996, while Copper Mines of Tasmania at Queenstown is planning to upgrade two winders, converting the cage winder to rock haulage.

The Anchor tin mine reopened during the year and is retreating tailings. The Duncan Colliery was placed on care and maintenance. The 101 year old Mt Lyell copper mine at Queenstown closed in December 1995, but was taken over by Copper Mines of Tasmania which hopes to resume production in 1996. Riltec's plant, set up to retreat gold tailings at Mathinna, failed to perform and was closed in February 1995.

Electrical work associated with new projects is being done to a high standard, but older plant and practices remain a concern. A special effort was put into reducing electrocution risk at metallurgical plants following a fatality at Pasminco Metals-EZ in June 1994.

### *Inspections*

There were 113 site visits during the year, comprising 70 inspections, 18 accident investigation visits, and 25 other site visits and meetings.

- *Hellyer*: Mine and mill electrics are in good repair, with those at ICI and Stotts having been improved.
- *Beaconsfield Gold*: At the end of June, the 180 ML pump station was almost completed, with an 11 kV supply fed down a borehole. The surface sub-station was revamped and a new winder was being readied for installation.
- *Cornwall Coal*: The Duncan mine was placed on care and maintenance, with a fan, dewatering pump and mine 11 kV power to be left on. The electrics are in good order.
- *Henty Gold*: The portal substation was completed. The winder was installed and run without ropes. The new 500 kV mine substations were inspected.
- *Mole Creek Lime*: Electrics are in good condition. Access ways have been much improved.
- *Copper Mines of Tasmania*: When the Mt Lyell Mining and Railway Company's operation ceased the electrics were in good order. CMT is using a 1000 v cable-supplied jumbo in the decline extension. Winders are expected to be modified for rock-only hoisting. The 220 Level 11 kV sub has been cleaned up. PCBs are still in service in capacitors. Electrical work has been well done.
- *Pasminco Rosebery*: The Southern Upcast shaft stripping was completed and equipped with two fans and an escape winder. Upgrade of the main winders will follow.
- *Renison*: Shaft stripping was to start in July; CEGELEC is to supply a Koëpe rock winder.

- *Savage River Mines*: Mine electrics are in fair order.
- *Comalco*: Electrics and plant are generally in good order.
- *Goliath Cement*: The plant upgrade has been completed, with electrics being well done. There is some concern about corrosion of aerial lines near the crusher.
- *Hydromet Risdon*: A wet chemical plant is to be erected uphill of the PM-EZ cell room to treat manganese residues for sale. Plans have been approved.
- *K & D Brick*: The plant has been improved significantly. A dust collection plant is to be installed in the clay preparation area.
- *Nubrik*: The new clay preparation equipment has been commissioned.
- *PM-EZ Risdon*: Much time has been spent on safety improvements in the cell room following the fatal electrocution in June 1994. Wider insulated approach walkways will be completed in September 1996. Four new transformer/rectifiers were installed, with 16 new cranes, a cathode-handling monorail system and No. 2 Stripper underway.
- *Temco*: Furnace electrical safety was upgraded by insulating earthed metalwork within 1.5 m of the electrodes or isolating by fencing. The electrodes operate at 275 V 50 Hz, with 160 V to earth.
- *Tioxide*: Electrics are in good order.
- *Quarries*: Electrics are generally in reasonable condition. However conveyor trip wires tend to be a problem on quarries.

### ***Safety Incidents***

- An excavator brought down 415 V lines over wastewater ponds.
- A 110 kW fan fell on a vehicle underground when suspension chains snapped.
- A 3.3 kV cable was crushed by a truck underground in September 1994.

### ***Equipment Approvals***

ASAHI blasting circuit continuity checker was approved for ICI.

### ***Investigations***

The remains of the Mt Bischoff mine hydro-electric power station at Waratah were inspected. Much equipment worth preserving is still on site. The original station, built in 1883, was the first in the State, the present station having been built in 1905.

The Inspector of Mines (Electrical) attended an electrical energy symposium on 12 November at Launceston and made a written submission in urging fair terms for independent generators.

## **METALLURGICAL INSPECTIONS**

### ***Riltec (Tasmania) Pty Ltd***

The Riltec gold processing plant, set up to treat gold-bearing tailings from the old Golden Gate mine at Mathinna using a resin-in-leach process, was officially opened on 13 December 1994. Because of extremely poor gold recoveries, the plant was closed on 30 January 1995.

The tailings dam, constructed next to Long Gully Creek, leaked and the effluent retained by it contained unacceptable concentrations of cyanide and arsenic. This became apparent when a fish-kill downstream of the dam was reported in December 1994.

It was decided that Industry Safety and Mines, in conjunction with the Division of Environmental Management of the Department of Environment and Land Management, would assume responsibility for reducing the cyanide concentration to an acceptable level. Two casual employees were engaged and the solution in the pond was circulated at a rate of 50 m<sup>3</sup> per hour for 24 hours a day through a mixing tank, where calcium hypochlorite was mixed to provide a 2% strength. This process continued for approximately two months until the concentration of total cyanide in solution was reduced from 25 mg/litre to 1 mg/litre, and that of free cyanide from 10 mg/litre to less than 0.1 mg/litre. A call was made on the environmental bond held against the lease to cover the cost of this remediation.

### ***Tasmania Mines Ltd***

Assistance was provided with the installation of a fine grinding and filtration circuit to produce fine magnetite for coal washeries.

### ***Comalco Aluminium (Bell Bay) Ltd***

Comalco has kept Industry Safety and Mines fully informed with regard to progress in projects which resulted in improvements to their management of occupational health and safety. These have included:–

- The encapsulation of 400 000 tonnes of cyanide-contaminated pot linings;
- The installation of lids on hot metal crucibles to prevent spillage during transport;
- A project for furnace delining; and
- The rerouting of hot metal carrier traffic from a passageway used by pedestrians.

### ***Pasminco Metals-EZ***

The Inspectors of Mines (Electrical and Metallurgical) have had considerable input into the design of modifications to the cell room at Risdon in an endeavour to eliminate the possibility of personnel receiving electric shocks.

**REVIEW OF MINERAL SECTOR OPERATIONS, 1994/95** **ABERFOYLE RESOURCES LTD (HELLYER DIVISION)**

**Base Metal Mines**

***Mining***

Ore mined totalled 1 325 075 tonnes at 13.4% Zn, 6.6% Pb and 168 g/t Ag. Production was carried out from sub-level open stopes and from pillar recovery, either under a caving hanging wall or against cemented aggregate fill.

***Milling***

The concentrator throughput for the year was 1.32 million tonnes. Concentrate production was:-

- Zinc concentrate — 255 964 tonnes @ 50.6% Zn, 3.1% Pb;
- Bulk concentrate — 45 317 tonnes @ 33.1% Zn, 13.6% Pb, 303 g/t Ag;
- Lead concentrate — 64 594 tonnes @ 55.6% Pb, 7.5% Zn, 478 g/t Ag;
- Cu/Ag Concentrate — 10 808 tonnes @ 4437 g/t Ag, 11.0% Cu.

***Exploration and Reserves***

Fifty-six diamond drill holes were completed during the year. The majority of these were for stope delineation and grade control purposes, with six holes drilled for rock mechanics. Six holes, totalling 3875 metres, were drilled for exploration purposes. Other drilling was for the testing of ore stratigraphy, and searching for extensions to the alteration zone at depth and to the footwall of the Hellyer ore horizon.

At 30 June 1995, the Hellyer ore reserves were 7.1 million tonnes at 0.3% Cu, 5.9% Pb, 12.0% Zn, 140 g/t Ag, and 2.2 g/t Au.

***Employment***

The workforce totalled 278 persons at 30 June 1995. Nine days were lost due to industrial disputes.

***Capital Expenditure***

Capital expenditure for the year totalled \$2.66 million, which included \$0.64 million spent on a pebble crushing mill in the concentrator and \$1.14 million spent on underground development.

***Environmental***

Rehabilitation of the Que River lease continued, with work concentrating on the S Lens brace stockpile, main portal and exploration pit areas. All redundant buildings and machinery have been sold by auction and are being progressively removed from the site.

Rehabilitation of the Cleveland Tin lease also continued, with work concentrating on the green dam area and maintenance fertilisation of previously rehabilitated areas. The mill, redundant buildings and much of the machinery have been sold by auction. Demolition of the mill has not yet commenced.

**PASMINCO MINING, ROSEBERY**

***Mining***

A total of 500 181 tonnes of ore at 11.04% Zn was mined. This compares with a planned production of 550 000 tonnes at 10.8% Zn. The bulk of the ore was extracted from J and B Lens, with some remnants taken in H and E Lens.

A total of 3615 metres of development was achieved against a target of 4983 metres.

The Southern Upcast fan installation was commissioned on 22 June 1995 and tests indicate that specification performance criteria were being met in terms of air flow rate and pressure.

A small resource, known as Farquars Knob, was mined by open-cut methods and has so far yielded 8300 tonnes of ore.

### ***Milling***

Ore treated totalled 500 181 tonnes, of which 494 483 tonnes originated from the Rosebery mine.

The mill headgrade reported at 11.04% Zn, 3.70% Pb, 0.41% Cu, 114 g/t Ag and 1.64g/t Au, compared to the previous years headgrade of 9.8% Zn, 3.17% Pb, 0.38% Cu, 97.39 g/t Ag and 1.85 g/t Au.

Concentrate production for the year was:-

- Zinc concentrate — 94 392 tonnes at 51.85% Zn;
- Lead concentrate — 9047 tonnes at 65.43% Pb, 1148 g/t Ag
- Copper concentrate — 3680 tonnes at 23.52% Cu, 11.25% Pb, 3409 g/t Ag and 63.23 g/t Au.

The gold plant produced 174.49 kg of doré containing 30.1% Ag and 68.8% Au.

### ***Exploration***

A total of 27 502 metres of diamond drilling was carried out. Of this 23 226 metres were drilled from underground sites. Drilling focused on the P Lens area with some holes targeting K Lens, M Lens and J Lens. Near-mine exploration focused on extensions to B Lens, J Lens and M Lens.

### ***Ore Reserves***

Ore reserves as at 30 June 1995 were:-

	<i>Tonnes</i> <i>(millions)</i>	<i>Pb</i> <i>(%)</i>	<i>Zn</i> <i>(%)</i>	<i>Cu</i> <i>(%)</i>	<i>Ag</i> <i>(g/t)</i>	<i>Au</i> <i>(g/t)</i>
Proved	1.8	3.3	10.1	0.4	117	2.4
Probable	1.5	3.5	11.7	0.5	126	2.1
<b>Total</b>	3.3	3.4	10.9	0.4	121	2.3

The ore reserve is part of a resource of 9.4 million tonnes.

### ***Employment***

At year end 299 people were directly employed by the mine.

The Menzies Centre conducted a blood lead level survey of children in the 1 to 4 year age group in the Rosebery community. This showed a significant reduction in the levels recorded in the 1992 survey.

### ***Capital Expenditure***

The total amount expended during the year was \$18.9 million, the major projects being the Southern Upcast Vent rise and deep exploration.

## Copper THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED

This company ceased production on 15 December 1994 after 101 years of continuous operation.

### *Mining*

Ore mined in the year totalled 775 362 tonnes at a grade of 1.64% Cu. All production came from the north end of 60 Series. Production flexibility was restricted in the latter stages due to deteriorating ground conditions and loss of draw points as cave material was drawn down. Production was 55 338 tonnes below budget.

### *Milling*

Ore treated totalled 795 232 tonnes which produced 45 062 tonnes of copper concentrate and 21 190 tonnes of pyrite concentrate. The copper concentrate contained 12 316 tonnes of copper, 283 kg of gold and 1680 kg of silver. Copper recovery was excellent at 93.81%. Pyrite production ceased in September with the expiry of the sales contract. The final copper concentrate shipment to Mitsubishi sailed on 2 January 1995.

### *Ore Reserves*

All proved ore reserves were extracted or written off during the year. Indicated and inferred resource estimates totalled 22 496 000 tonnes at 1.64% Cu on closure. The bulk of these resources are in the Prince Lyell 60–80 Series and Western Tharsis.

### *Employment*

Employment fell from 310 (229 permanent employees plus 81 contractors) in June 1994 to 200 in December as production tasks reduced. Approximately 20 administration staff were retained after closure but were progressively retrenched up to June.

### *Safety*

There were nine lost-time incidents resulting in a LTIFR of 32, compared with 11 incidents and LTIFR of 15 for 1993/94. Injuries were relatively minor, with an average duration of 6 days.

### *General*

Agreement was reached with Copper Mines of Tasmania on the purchase of mine assets. This agreement, and the transfer of the mining leases, were executed on 30 December 1994. Certain heritage items, including the General Office and Assay Laboratory, Museum, artefacts and archives were excluded from the sale and donated to the community.

### *Mine Closure Obligations*

As a result of the agreement with Copper Mines of Tasmania, the bulk of the company's closure obligations have been assumed by that company. Those items not included have been completed to the satisfaction of the parties concerned.

## COPPER MINES OF TASMANIA PTY LTD

### *General*

Copper Mines of Tasmania Pty Ltd (a wholly-owned subsidiary of Gold Mines of Australia Ltd) signed a Memorandum of Understanding with the State on 28 June 1994 to take over the mining leases at Mount Lyell on their relinquishment by the Mount Lyell Mining and Railway Co. Ltd. A formal agreement was signed in October 1994 and this was subsequently ratified by the *Copper Mines of Tasmania (Agreement) Act 1994*. The major condition of the

agreement was the exemption of CMT from the effects of on-going environmental problems resulting from conditions relating to previous mining operations and declaring the project a *Project of State Significance*. CMT agreed to carry out a \$5 million exploration drilling and assessment program and to proceed to a full feasibility study.

GMA agreed to purchase all mining equipment and infrastructure from the Mount Lyell company, and this purchase and the transfer of the Mining Leases occurred on 30 December 1994.

Drilling of the Prince Lyell orebody commenced in August 1994, and following initial evaluation CMT committed to a \$10 million underground development contract to access deeper Prince Lyell ore.

Parliament was recalled in early February 1995 to approve Ministerial guidelines to the Sustainable Development Advisory Council to carry out an integrated assessment of the CMT project, and to pass an amendment to the act allowing CMT to proceed with preparatory works while the assessment was being carried out. SDAC has completed its initial assessment and held public hearings. The final recommendation to the Minister is to be made by 31 August 1995, with final Ministerial direction to be completed by 30 September.

In June 1995 CMT announced that, based on the assessment of a full feasibility study, it would proceed to a production operation at Mount Lyell, subject to final approval to proceed from Government. On the basis of the initial favourable recommendation from SDAC work is proceeding to allow production to recommence by the end of 1995.

A major contract has been concluded with National Mine Management Pty Ltd to carry out all development and production mining for a sub-level caving operation. Development is well advanced and production could commence by October 1995.

The concentrator is being rehabilitated and the circuit redesigned for treatment and pumping of tailings to a tailings dam on Princess Creek. A small pilot tailings dam has been completed to handle the first year's production. This will be operated to allow return of decant water to the mill to allow full assessment of options for treatment of tailings and mine water.

### ***Capital Expenditure***

Approximately \$20 million has been spent to date on mine exploration, mine development, and plant rehabilitation and construction. It is estimated that the total initial project cost will be approximately \$50 million.

### ***Employment***

Since the project commenced in January 1995 employment increased to 165 persons by June. Direct employment at full production (3.5 million tonnes/year in 1997) is expected to be 250, with total direct and indirect employment estimated as 900. CMT plan to use contractors for all operations other than the concentration plant but a large part of the contract work force will be recruited from the local community.

### ***Safety Performance***

No lost time injuries were reported during the first six months of the operation to June 1995.

## Iron Ore SAVAGE RIVER MINES

Development of both the South Lens and North Pits proceeded according to plan, with completion scheduled for June 1996.

There was strong product demand from both Australian and Asian markets that required production of almost 1 500 000 tonnes of concentrate.

The feasibility study into underground mining was completed and assessed. The high capital investment, associated with an uncertain exchange rate and market requirement, proved to be too high an economic risk. Consequently it was decided to mine the remaining reserve and cease operations by March 1997.

Production for the year was:-

All material	7 562 170 tonnes
Rock to waste	3 503 340 tonnes
Crude ore mined	4 058 830 tonnes
Concentrate produced	1 495 329 tonnes
Concentrate pumped	1 494 039 tonnes
Pellets produced	1 469 268 tonnes
Pellets shipped	1 443 260 tonnes
Pellets inventory	310 286 tonnes
Concentrate and chip sales	102 944 tonnes

There were 40 pellet shipments and four concentrate shipments during the year.

Capital expenditure relating to pit development consisted of waste stripping, pit slope dewatering and drainage, light vehicle and mine service fleet replacement, and the feasibility study.

Continuing expenditure on other works consisted of plant corrosion control, concentrate pipeline maintenance, mine site rehabilitation and offshore loading facility maintenance.

Employment was reduced from 229 to 203 by a voluntary redundancy program.

## TASMANIA MINES LIMITED

Production for the year totalled 113 698 tonnes of magnetite and 39.9 tonnes of scheelite. Sales of products totalled \$3,062,088.

Capital expenditure comprised \$154,700 on a new coal washery and circuit, \$11,200 on dam construction, \$8,500 on a feasibility study for a long-term tailings dam, and \$19,000 on a replacement loader.

A long-term feasibility study for construction of a tailings dam is currently being carried out in the Horizontal Creek area, within the consolidated lease. This tailings dam would be constructed in three stages as the dam fills, with Stage One having a five-year lifespan. The existing tailings dams have a limited capacity, and construction of the Horizontal Creek dam will need to commence in the near future.

The average number of employees for the year was 22. There were three lost-time accidents, with a total of 31 days lost.

## **Tin RENISON LIMITED, RENISON BELL**

The company sustained an operating loss for the first half of the year due to the continued low world tin price. The price improved substantially during the second half of the year, although this has been offset to some extent by the strengthening of the Australian dollar against the American dollar. Production was 36 406 tonnes higher than for 1993/94 but lower ore grade and recovery resulted in a reduction of 222 tonnes of tin in concentrates.

### ***Mining***

Ore production from underground was 660 176 tonnes at a grade of 1.52% Sn. Production from bench stopes is increasing as the upper areas of the mine are worked out. Contract hand-held mining is being utilised in the Penzance ore body.

### ***Development***

Development for the year totalled 3922 metres, of which 2478 metres was developed by contractors. Following approval of the Rendeep project, Faminco Pty Ltd were awarded a contract for shaft access, crusher station and Renison North Decline development, and commenced work on site in October 1994. Mancala Pty Ltd were awarded the shaft mining contract and at year end had completed the pilot hole and raise boring of the upper half of the shaft to 1.8 metres. The shaft will be benched to a final diameter of 4.2 metres. Shaft commissioning is now expected to be brought forward to March 1996.

### ***Milling***

The processing plant treated 660 176 tonnes of ore for the production of 7303 tonnes of tin in concentrates. Processing plant performance was disappointing compared to 1993/94, with recovery at 78.2% compared to 81.5% for the previous year and concentrate grade of 50.9% (55.1%). Kelsey jig recovery remained high but cassiterite flotation was adversely affected by inconsistent ore blending, ore grade fluctuation, and power outages. Plant modifications are expected to result in improved performance in the coming year.

### ***Capital Expenditure***

The capital expenditure of \$14.4 million was double that of 1993/94. Of this total, \$9.6 million was related to mining, reflecting the development and equipment purchases related to the shaft project and North Decline extension, while \$3.3 million was spent on mill circuit modifications including additional large Kelsey jigs, upgrading of screens, and a centralised on-stream analysis system.

### ***Employment***

Permanent employment increased from 235 to 241. Contract employment varied throughout the year but averaged approximately 100 people. Faminco Pty Ltd, Mancala Pty Ltd and raise boring contractors associated with mine development represented the major contract employers.

### ***Safety Performance***

Three lost-time accidents were recorded for the year, two of these being contract employees. A fatal accident occurred underground to a drill jumbo operator. The LTIFR was 3.72.

### ***Environment***

A draft Environmental Management Plan has been submitted for approval. The final version is expected to be approved for operation for the three years from 1995/96.

Work is continuing on monitoring programs and rehabilitation studies. Corporate policy now requires that all RGC operations develop a detailed closure plan, and this is being progressively developed.

## **SPECTRUM RESOURCES AUSTRALIA PTY LTD — ANCHOR MINE**

Since the plant was recommissioned in January 1995 the mill has produced 28.5 tonnes of dry concentrate from 13 600 tonnes of ore sourced from the treating of tailings and remaining surface and underground stockpiles.

Capital expenditure totalled \$342,600, with \$77,100 for concentrator modifications and \$265,500 for mobile equipment and fixed plant.

Fifteen people were employed on site at 30 June.

## **Coal THE CORNWALL COAL COMPANY NO LIABILITY, FINGAL**

Coal sales for the year were 260 697 tonnes. Total raw coal production was 527 659 tonnes, with a washery throughput of 459 355 tonnes yielding 275 157 tonnes of saleable coal (59.9% recovery).

Direct employment fell to 76 following the closure of the Duncan Colliery. Cartage contractors employ nine people, while five people were employed intermittently for open-cut work. A new Enterprise Agreement has been negotiated with employees.

The washery has successfully worked for three years without any lost-time accidents. Two minor lost-time injuries occurred at Blackwood.

### ***Duncan Colliery***

Raw coal production was 103 741 tonnes, won mainly from pillar retreat. The mine was put on a care and maintenance basis at the end of 1994 following the loss of the Australian Newsprint Mills contract.

### ***Blackwood Colliery***

Production was 361 692 tonnes. Development extended workings by approximately 900 metres. Deteriorating quality required earlier than anticipated pillar retreat using breaker line props. Floor heave was a problem and caused poor yields.

### ***Open Cuts***

The Blackwood and Huntsman open cuts produced 62 626 tonnes of coal. Both have been largely worked out and rehabilitated. Development of the Huntsman No. 2 open cut is proceeding.

## **MERRYWOOD COAL COMPANY PTY LTD, ROYAL GEORGE**

Coal sales for the year were 124 755 tonnes. Raw coal production totalled 148 267 tonnes, with 966 000 cubic metres of overburden being removed.

Thirty people were employed at the mine, while three full-time and one part-time employees service the operation from a workshop at Longford. The contract trucking operator employed another eight people. An Enterprise Agreement is presently being negotiated with employees. Two lost-time injuries occurred during the year.

A jig washery, purchased at Singleton, NSW, was dismantled and re-erected at Merrywood. Initial commissioning problems have generally been overcome and the plant is now working well. The result is that roof coal can now be processed and stockpiles of seconds coal can be washed to 21% ash suitable for blending. As the mine has developed into unworked ground, production from pillar recovery from the former underground mine has fallen to approximately 30%.

Exploration has continued at Mt Puzzler, Royal George and Mt Rex.

**KIMBOLTON COAL JOINT VENTURE,  
LANGLOH, HAMILTON**

A bulk sample was completed and washed at Merrywood for a successful trial shipment to Australian Newsprint Mills. An environmental impact assessment is being carried out to permit mine approval to proceed.

## Mineral Processing operations

### AUSTRALIAN PAPER

Mining operations at the Tonganah kaolin mine concentrated on the Northern Tonganah deposit, with occasional input from the No. 8 mine.

#### *Production*

All material mined	364 129 tonnes
Raw clay mined	202 514 tonnes
Waste/overburden mined	161 615 tonnes
Concentrate produced	28 669 tonnes

Mine development waste was transported to the No. 3 mine, where rehabilitation is now 80% complete.

#### *Capital Expenditure*

Capital expenditure for the year totalled \$23,000, which included money for a hydraulic drum crusher and concrete work.

### COMALCO ALUMINIUM (BELL BAY) LIMITED

A total of 95 192 tonnes of aluminium was produced for the financial year. Employment for the year averaged 637 Comalco employees plus 195 full-time equivalent contractor employees.

There were 40 lost-time injuries for the year; 30 of these were to Comalco employees while 10 were to contractor employees.

The LTIFR was 25.6 for Comalco employees and 27.9 for contractor employees, with an overall average of 26.2.

Capital expenditure for the year was \$13.4 million. Major projects were:-

- Butt coarse cleaning — \$1.5 million
- Scrubbers upgrade — \$1.2 million
- Spent cell lining encapsulation — \$4.5 million
- Cell delining facility — \$1.0 million
- Vertical direct chill automation — \$0.9 million
- Other (less than \$0.5 million each) — \$4.3 million

### DAVID MITCHELL LIMITED (Mole Creek Limestone)

Production for the financial year totalled:-

- Limestone quarried — 99 093 tonnes
- Overburden and waste removed — 273 734 tonnes
- Aglime and stockfeed stone — 13 603 tonnes
- Crushed and screened stone — 6952 tonnes

Capital expenditure for the year comprised \$15,000 for a second-hand fork lift truck, \$30,000 for a FGLS separation plant, and \$10,000 for a grit screening plant.

The workforce comprised 26 people. One accident, with two days lost time for a minor injury, was reported. All workers have undergone medical checks.

## ***Developments***

Work is continuing on removal of a 30 metre thick low grade limestone seam which overlies the main deposit. The current market downturn is expected to reverse during 1996, with plans to install a state-of-the-art fluid bed calciner.

## **GOLIATH PORTLAND CEMENT COMPANY LIMITED**

Overburden removed from the old and new quarries totalled 20 435 tonnes and 760 233 tonnes respectively.

Production for the year was:—

Limestone	1 290 000 tonnes
Clay	38 000 tonnes
Clinker	841 000 tonnes
Cement	941 000 tonnes

There were, on average, 186 Goliath employees and 47 full-time equivalent contractor employees during the year.

There were four lost-time accidents for the year, one to a Goliath employee and three to contractor employees. The LTIFR was 2.6 for Goliath employees and 30.2 for contractor employees, resulting in an overall average of 8.2.

Capital expenditure for the year was \$6.36 million on the following projects:—

Silos	\$1.14 million
Computers	\$0.30 million
Vehicles	\$0.20 million
Mobile equipment	\$0.54 million
Plant equipment	\$0.71 million
Cranes and hoists	\$0.94 million
Instrumentation	\$0.31 million
Plant upgrade	\$2.22 million

## **IMP SILICA**

Index Mineral Processors operated their Heybridge plant intermittently during the year, with five people producing high-quality silica for overseas markets. No lost time injuries were recorded for the year.

## **IMPACT FERTILISERS**

Production for the year was 100 004 tonnes of single superphosphate using imported phosphate rock and sulphuric acid from Pasminco Metals-EZ.

There were, on average, 44 Impact employees and two full-time equivalent contractor employees during the year. There was one lost-time injury, to an Impact Fertilisers employee, for the year. The LTIFR at the plant was 10.4.

Capital expenditure for the year was \$0.2 million. This was spent on sewerage upgrade, screening plant design work, and power and compressed air supply.

The company commenced supply of single superphosphate to mainland Australia. New Impact-owned distribution depots were set up in northern Tasmania.

## PASMINCO METALS-EZ

Zinc concentrate roasted during the year totalled 387 944 tonnes. Marketable zinc metal production was 189 067 tonnes, with 316 tonnes of cadmium, 25 676 tonnes of lead residue, 3062 tonnes of copper sulphate and 347 150 tonnes of sulphuric acid being produced.

There were, on average, 659 Pasminco employees plus 107 full-time equivalent contractor employees. There were 64 lost-time injuries for the year, of which 50 were to Pasminco employees and 14 to contractor employees. The LTIFR was 39.5 for Pasminco employees and 68.3 for contractor employees, resulting in an average of 43.8.

Capital expenditure for the year was \$15.4 million on the following projects:-

No. 2 fixed stripping machine	\$1.8 million
Spent recirculation	\$0.3 million
Replacement of rectifiers	\$8.5 million
Replace three spent tanks	\$0.8 million
Sewerage system	\$0.8 million
Manganese dioxide removal handling	\$0.7 million
Other minor projects	\$2.5 million

New developments have included the approval of a process that should effectively end Pasminco's ocean disposal of jarosite. Subject to further discussions with Federal and State Governments, this co-treatment process should progress to implementation.

## TEMCO (BELL BAY)

Production for the year amounted to 109 128 tonnes of ferromanganese, 90 331 tonnes of silicomanganese and 300 059 tonnes of sinter.

Employment averaged 357 Temco employees plus 93 full-time equivalent contractor employees. There were 18 lost-time injuries for the year, 13 to Temco employees and five to contractor employees. The LTIFR was 20.2 for Temco employees and 29.9 for contractor employees, with an overall average of 22.2.

Capital expenditure for the year totalled \$11.3 million on the following projects:-

- \$0.9 million for an upgrade of the 22 kV electric switchyard, which will improve the availability of the No. 5 furnace baghouse fan and the effectiveness of fume collection from the fines addition station at No. 5 furnace via the existing tapping and casting fume baghouse;
- \$5.4 million on furnace 1 and 2 environmental upgrade, which focused on reducing air emissions and improving furnace handling conditions for the workforce. This included provision of tapping and casting fume collection ductwork, fans and baghouse;
- \$2.0 million on environmental improvements to the sinter plant, including installation of a new electrostatic precipitator.

Temco has been successful in procuring part funding, from both the State and Federal Governments via the 'Investment Promotion Program', for a pre-feasibility study for downstream usage of silicomanganese slag. A local concrete block manufacturer has successfully launched a new product line, *Insulite*, based on the use of aerated silicomanganese slag aggregate.

## **TIOXIDE AUSTRALIA PTY LTD**

This company produces titanium dioxide pigments from titanium slag imported from Canada.

Employment for the year averaged 191 Tioxide employees plus 55 full-time equivalent contractor employees. There were nine lost-time injuries during the year, five to Tioxide employees and four to contractor employees. The LTIFR was 13.2 for Tioxide employees and 36.6 for contractor employees, with an overall average of 18.5.

In December 1994 the Burnie site was audited by DNV and received an A2 rating on the International Safety Rating System.

Rehabilitation of the No. 2 slimes dam has continued throughout the year, with the surface now covered with a layer of waste lime and coal ash.

Capital expenditure for the year was \$1.3 million, which was distributed between safety, health and environmental projects, conversion to slag feedstock, production increase and plant renewals.

## **Ceramics K & D BRICKS AND PAVERS**

### ***Production***

Production of fired clay bricks and pavers in 1994/95 totalled 13.7 million units from 37 543 cubic metres of raw materials. The new clay grinding plant performed well, apart from high dust emissions. A new loader was purchased and further improvements made to the display area. Average employment was 47 persons. A downturn in the building industry resulted in poor sales prospects at year end.

### ***Health and Safety***

An audit for the 1995 Intermine Safety Award confirmed a strong company effort at managing safety and health. Injury statistics improved; at year end three months without a lost-time injury had been achieved. Asbestos was cleared from old buildings on site and enclosure of dust sources in the clay preparation area is in hand.

## **NUBRIK**

### ***Production***

Material processed for fired brick and paver production totalled 35 480 cubic metres. The clay preparation and grinding plant was rebuilt at a cost of \$497,000, which not only reduced processing time but also greatly reduced dust generation. Average employment was 47 persons. Product demand at year end was low.

### ***Health and Safety***

Safety performance was markedly improved over 1994/95, with only one short-duration lost-time injury, giving a LTIFR of 12.

## **Pigments SAVAGE RESOURCES LIMITED**

This company has the following resources:-

### ***Yellow ochre***

- HT site — 47 000 tonnes proven/probable, sufficient for 20 year life; other areas yet to be investigated.

### ***Brown umber***

- Bowry Creek site — 22 000 tonnes proven/probable, sufficient for 20 year life; other areas yet to be investigated.

## ***Black***

- Long Plains site — 383 000 tonnes @ 69% DTR, sufficient for in excess of 20 year life. The full probable geological resource is around 9.5 million tonnes @ 44.6% DTR.

The capital expenditure required over the first five years of operation would be in excess of \$5 million, with a minimum requirement of up to 20 employees.

## **Quarries BEAMS BROTHERS PTY LTD**

Beams Brothers produced 30 616 tonnes of crushed stone, 4716 tonnes of dolomite, 42 441 tonnes of Aglime, and 12 997 tonnes of ironstone from their Flowery Gully operation. Capital expenditure for crusher, screen and conveyors was \$85,000.

## **BESSER TASMANIA PTY LTD**

Gravel and sand production totalled 46 640 tonnes. The operation employs two people, and no lost time injuries were reported. Progressive rehabilitation of worked out areas is continuing.

## **BORAL RESOURCES**

Boral Resources produced 840 000 tonnes of crushed rock and 122 000 tonnes of sand and gravel from its Tasmanian operations. Capital expenditure of \$1 million was spent on plant improvement, mobile equipment and rehabilitation at the Brighton and Mt Nassau quarries and the Pipers River gravel pit. The group reported three lost-time injuries for the year.

## **BRAMBLES EQUIPMENT**

Production from Brambles' various quarries totalled 487 000 tonnes. About half of this total was used for road base material and highway construction.

## **CAROLINE QUARRIES**

Production for the year was 29 920 tonnes of silica sand, 120 m<sup>3</sup> of concrete sand, and 122 m<sup>3</sup> of general sand. There was a minimal increase in production during 1994/95 despite the increased production of Goliath Cement, which purchases all of its silica needs from Caroline Quarries. Rehabilitation of the worked-out portion of the quarry will be completed by 31 July 1995.

## **CIRCULAR HEAD DOLOMITE AND TRADING COMPANY PTY LTD**

Production for the year totalled 41 034 tonnes of agricultural dolomite, 37 253 tonnes of metallurgical dolomite, and 8046 tonnes of dolomite screenings.

Capital expenditure comprised \$64,500 on plant and machinery and \$8800 on buildings and alterations.

The workforce averaged 12 employees; no lost time accidents were recorded.

## **G. J. CRESSWELL'S TRANSPORT PTY LTD**

This company produced 123 732 tonnes of base and sub base road materials.

Capital expenditure and improvements were made to the feed and screening equipment and a gantry was installed over the primary crusher.

## **CSR READYMIX**

Readymix produced 154 144 tonnes of crushed dolerite for the year from their Mornington plant, well below the capacity of 200 000 tonnes per annum.

Capital expenditure was \$25,000 on the resealing of the entrance road to the quarry, and \$12,000 on an overhead gantry and hoist. Over 600 trees were planted as part of the rehabilitation requirement.

Employment was constant at ten in the quarry and two in the laboratory.

## **HOBART BLUE METAL INDUSTRIES**

Production totalled 354 500 tonnes of material, comprising 325 000 tonnes of crushed rock, 10 000 tonnes of gravel, and 19 500 tonnes of sand.

Capital expenditure consisted of \$150,000 for a mobile screen and \$50,000 for plant improvements.

As of 30 June twenty people were employed on site. There were three lost-time accidents for the year.

## **INDUSTRIAL SANDS AND SILICA PTY LTD**

Production of road gravel and sand totalled 126 000 m<sup>3</sup>. This quantity included beach shingle and blasting grit sourced from outside the lease.

Capital expenditure comprised \$12,000 for a second-hand fork lift and \$38,000 for building improvements and fencing of dams.

The workforce averaged four employees. No lost time accidents were recorded.

## **PIONEER FLAGSTAFF GULLY**

Production totalled 191 858 tonnes of crushed dolerite. Capital expenditure was \$70,000 for new office buildings.

## **STORNOWAY-HEWITT, BEAUTY POINT**

Production for the year totalled 100 000 tonnes of sand. Capital expenditure on the upgrading of the sand washer was \$20,000.

## **STORNOWAY GRAVEL**

Production totalled 150 000 tonnes of road base material. No capital expenditure was outlaid for the period under review.

## **Tasmanian Gold Industry**    **BEACONSFIELD JOINT VENTURE**

This project is operated as a joint venture between Beaconsfield Gold NL (38%), Allstate Explorations NL (40%) and Posgold Ltd (22%). Posgold Ltd placed its interest out to tender in December 1994. In July 1995 it was announced that this interest had been acquired by Golden Shamrock Mines Ltd.

### ***Development***

Work during the year was directed towards accessing the gold resource remaining below the old mine. This initially requires the dewatering and rehabilitation of the Hart Shaft. Work completed included dewatering from 144 metres to 222 metres, rehabilitation and re-equipping of the shaft to the 180 metre level, construction of a stage pump station at the 180 metre level, and upgrading of the electrical supply system to cater for the increased load. The pump station was commissioned and the three submersible pumps lowered to 250 metres, allowing dewatering and rehabilitation between 180 metres and 400 metres to commence.

### ***Capital expenditure***

Expenditure during the year totalled \$4.4 million on development activities and \$825,000 on resource drilling and exploration.

During the year dewatering to 200 metres and diamond drilling between 700 and 900 metres was completed. A further \$11 million capital program was approved for completion of dewatering and shaft refurbishment, purchase and installation of a winder and headframe suitable for long-term requirements, upgrading of electrical supply, and establishment of a ventilation system to allow off-shaft development to commence.

### ***Ore resources***

An inferred and indicated resource of 600 000 to 700 000 tonnes at 20–25 grams/tonne of gold has been identified below the old mine workings at depths of between 450 and 700 metres. The drilling program completed during the year indicates that the Tasmania Reef continues to a depth of at least 900 metres. A further three-hole program is underway to test the reef for a further 200 metres.

### ***Employment***

The majority of the work has been done on contract. Employment has increased over the year and at year end 32 people were employed. Three lost-time injuries were incurred, all relatively minor with 11 days lost. Because of the low employment level the LTIFR was high at 69.8.

## **RGC (TASMANIA) LTD, HENTY GOLD PROJECT**

The Henty Gold Project is being developed by RGC (Tasmania) Limited, a wholly-owned subsidiary of Goldfields Limited. Project life is estimated as 4.5 years based on the probable reserves of Zone 96. The mine will be accessed via a sub-vertical shaft collared approximately 100 metres below surface and accessed by a decline. The mine will utilise both mechanised and hand-held cut and fill stoping methods. Production is scheduled to commence in June 1996.

### ***Mine development***

Mining of the shaft access, ventilation rise and shaft pilot hole was completed in 1993/94. During 1994/95 ventilation installation was completed, sky shaft steelwork was installed, and the permanent mine winder was installed and commissioned without ropes.

Zeni Drilling Pty Ltd were contracted to drill the shaft. Shaft drilling was done in three passes to open out the excavation to the final 3.2 metre diameter. By the end of the year 335 metres had been drilled and the shaft was completed to 402 metres by August 1995. Due to problems encountered in reaming the final

3.2 metre diameter pass, the shaft was shortened by approximately 40 metres from than the original design. Mine development layout has been modified to cater for this difference, with access now from one level only with incline and decline access to the ore zone. The shaft equipping contract has been awarded to Peabody Resources Limited, who are expected to commence on site from late August 1995.

### ***Capital expenditure***

Expenditure for the year was \$9.171 million, bringing total expenditure to date to \$20.175 million.

### ***Mill design***

Ore processing will be by conventional carbon-in-pulp/carbon-in-leach technology. A contract for engineering, procurement and project management has been awarded to Bateman Kinhill and design work is nearing completion. The plant is scheduled to be installed and commissioned by May 1996.

### ***Employment***

Employment for the year averaged 41, with over 150 personnel involved with the project over the year. Employment is expected to peak at 150 during construction, with permanent employment of approximately 70 people.

### ***Safety performance***

Three lost-time injuries were recorded, with a LTIFR of 40.2. A total of 42 days were lost due to injury.

### ***Ore resources***

Probable ore reserves for Zone 96 are stated as 506 000 tonnes of ore at a grade of 26.9 g/t Au.

A close-spaced diamond drilling program is underway to upgrade the Sill Zone resource to reserve status. Mining will probably commence from the Sill Zone to allow commissioning of the treatment plant on schedule.

### ***Environmental control***

The project has received national recognition for its commitment to excellence in environmental management.

## **RILTEC (TASMANIA) PTY LTD**

The Riltec operation at Mathinna in the northeast was officially opened by the Premier on 13 December 1994. The operation, designed for the treatment of gold-bearing tailings from the old Golden Gate mine by a resin-in-leach process, had commenced some weeks earlier.

Shortly before Christmas, it was reported that there had been a fish kill in Long Gully Creek and it was concluded that cyanide-contaminated effluent was leaking through the base of the Riltec tailings pond into the creek.

At the end of January 1995, Riltec (Tasmania) Pty Ltd ceased operations as insufficient gold had been recovered to meet their commitments, and the company was placed in receivership.

Industry Safety and Mines engaged two casual workers and, with assistance from the Division of Environmental Management of the Department of Environment and Land Management, undertook the detoxification of the effluent in the tailings impoundment. This was carried out for 24 hours a day, seven days a week initially, reducing to shorter hours of work when the cyanide concentration reached a less disturbing level, and continued until the end of March when it was agreed by both Divisions that the concentration was of an acceptable level.

## MANCALA PTY LTD

During the year, Mancala carried out 800 metres of costeaning on the leases purchased from Tas Tiger Mines in the Alberton area. Information gained was being assessed at year end.

## PARACLETE RESOURCES PTY LTD

During the year a program of costeaning, geological mapping, soil sampling and assaying was carried out over an area of about six hectares near Queenstown.

## Mining and Mineral Development Section

A specialist mining and mineral processing section operates within the Development Division of Tasmania Development and Resources. This Section links the Development Division's work with the technical activities of Industry Safety and Mines, ensuring a high level of co-operation and interaction between the two divisions. The Section directly promotes development of the mining and mineral processing sectors and supports ISM through joint promotion of exploration activity in the State.

The major objectives of the Development Division are:-

- develop an internationally regarded and sustainable competitive mining and mineral processing sector in Tasmania;
- promote investment and employment opportunities in existing and potential new value-adding industries;
- create a stable and secure investment environment in the industry; and
- facilitate infrastructure development to increase Tasmania's competitive advantages, including appropriately located clusters of compatible industries.

The Mining and Mineral Development Section provides a wide range of services to advance and encourage a sustainable future for mining and mineral processing in Tasmania. These services include:-

- facilitation of projects;
- promotion of resource development opportunities to targeted Australian and overseas companies;
- provision of technical assistance and help in regulatory matters; and
- acting as a liaison between the mineral sector and government, both State and Federal.

### *Mt Lyell Project*

Following the announcement by Renison Goldfields Consolidated (RGC) that it would cease operations at Mt Lyell at the end of its mining program and relinquish the lease, efforts began to market the remaining ore resource. A small number of targeted companies were contacted directly, and company submissions and extensive negotiations followed. In June 1994, the State Government signed a Memorandum of Understanding with Gold Mines of Australia Limited (GMA) to take over the Mt Lyell lease on the departure of RGC.

GMA announced on 2 June 1995 that it had approved the redevelopment of the Mt Lyell mine. This decision followed assessment of a detailed feasibility study and satisfactory resolution of power and concentrate transport contracts. GMA has established a subsidiary company, Copper Mines of Tasmania (CMT), to carry out its work on the Mt Lyell copper and gold mining leases.

Capital expenditure prior to production commencement will be approximately \$40 million. Based on current ore reserves, project life is at least 10 years and GMA is confident that these reserves will be extended considerably. Research is

continuing on downstream processing options and GMA intend to proceed to the production of copper metal after four years if adequate reserves are proved.

National Mine Management Pty Ltd has been awarded a contract for all mine development and production. Total contract value is estimated to be \$100 million. Construction of the Stage 1 tailings dam and the pipeline access are nearly complete. Access to the main dam site has been completed and test drilling is almost finished.

Production, at a rate of 1.5 million tonnes per year, is scheduled to commence in December 1995, with the first concentrate to be shipped in March 1996. Production will be built up over three years to 3.5 million tonnes per year. The operation will employ 250 people directly, with total direct and indirect employment estimated to be about 900.

The Sustainable Development Advisory Council (SDAC) released a draft environmental assessment report in June 1995. The recommendations from the final report will form the environmental guidelines for the Mt Lyell project.

### ***Henty Gold Project***

The Henty Gold Project is wholly owned by Goldfields Limited. An underground mine is planned and is expected to produce about 110 000 tonnes of ore annually for its scheduled 4½ year life. Annual gold production will average about 90,000 ounces. Mine access and ore haulage will be through a 440 metre deep shaft collared in a chamber located approximately 100 metres below the surface. Production is scheduled to commence in calendar year 1996. The capital cost of the project is \$53 million.

The shaft drilling operation has had continuing problems with the cutting head and removal of drill cuttings, leading to the mining and equipping of the shaft falling three months behind schedule. To compensate for the delay to development of the Zone 96 ore body, the Sill ore body, which may be accessed off the existing decline, will be developed so that the treatment plant can be commissioned by June 1996 as planned.

A contract for engineering, equipment procurement and project management and mill design has been awarded.

### ***Rendee Project***

RGC announced in June 1994 that a \$34 million project had been approved at the Renison tin mine. The project, known as Rendee, is based on ore bodies delineated by a diamond drilling program which commenced in 1989. Mine life will be extended from a minimum of seven to at least 13 years. The Section played a positive role in RGC's evaluation of the project. Before the Rendee commitment, mine life was estimated at only three to four years. The Rendee project will employ an additional 50 people, with the shaft scheduled to commence operations in 1996/97. The shaft will allow an increase in production to 9000 tonnes of tin a year, and will significantly reduce mine operating costs and lower the mine's position on the international tin mining cost curve.

### ***Tioxide***

TDR has continued to work with Tioxide Australia Pty Ltd management to secure the long-term future of the Heybridge plant. Support from TDR, and substantial efforts by company management, have resulted in an operation that is increasingly competitive in terms of cost, quality and safety. The changeover from ilmenite to high titanium slag feedstock during June 1994 has enabled the company to meet its environmental requirements.

After discussions with the Department of Environment and Land Management, Tioxide received approval to increase production to a rate of 40 000 tonnes per annum for a trial period of six months. Should this trial confirm modelling results that show emissions will be below environmental requirements, the company's licence to operate will be amended to allow the higher rate. Once

this production rate is achieved, Tioxide will seek approval for a further increase to 45 000 tonnes per annum.

Extensive work is being undertaken on utilising the waste acid stream from Tioxide. Laboratory-scale work, based on a Tioxide-developed process using waste acid effluent as a leaching agent, indicated that zinc and lead may be successfully recovered from the tailings at the Hellyer mine.

Following the success of this work Tioxide, supported by the TDR, proceeded to develop the leach process at bench scale to a level where a preliminary economic and technical feasibility evaluation could be undertaken.

The potential use of effluent from the Tioxide pigment plant to produce iron oxide pigment is also being investigated.

### ***Beaconsfield Gold Project***

Work commenced on deeper draining of the shaft and a further drilling program to test the reef to 400 metres below the old workings. A decision is expected by late 1995 on major expenditure to complete shaft rehabilitation and underground development for deeper resource drilling.

This phase of the Beaconsfield project is progressing well. The sixth and last surface drill hole of the current program is in progress. All five holes to date confirm that the reef continues to at least 400 metres below the old workings. The reef was intersected at approximately 300 metres below the old workings and showed 4.8 metres horizontal width at 58.2 grams per tonne of gold. A revised ore resource estimate is to be produced on completion of the drilling program.

The Joint Venture partners have approved progress to the next phase of the project. This will involve upgrading of the electrical supply, installation of a permanent winder and headframe, a stage pump station at the 180 metre level, shaft rehabilitation to a depth of 385 metres, and establishment of a permanent ventilation circuit. This project is estimated to cost \$11 million.

### ***Savage River Project***

Savage River Mines has confirmed its intentions to cease operations in early 1997. An information memorandum has been prepared, based on technical and financial studies commissioned by Savage River Mines.

Consultancies have been commissioned to report on the economic life and maintenance of facilities.

TDR is leading a task force to target potential operators to redevelop the operations. A similar approach to that used to attract GMA to Mt Lyell has been adopted. That is, a small number of targeted companies are being approached directly, followed by company submissions where appropriate. Potential candidates may have a range of views on how to develop the available resources. Proposals may include downstream processing of iron ore.

### ***Industry Zones***

TDR is committed to the development and promotion of secure heavy industry zones, with appropriate infrastructure, zoning, and location, supported by environmental and development guidelines, and offering the opportunity of true cluster development. This long-term industry development already includes one such zone at Bell Bay. TDR is working with the Circular Head Council to finalise the establishment of the Port Latta Industrial Zone in the northwest.

The Port Latta Industrial Zone offers investors long-term site integrity and is situated next to a deep-water port, and is linked to established rail and road networks. Like the Bell Bay zone, it also includes buffer areas between industrial and residential developments.

**Mineral production from Tasmanian  
sources since 1880**  
**Quantity of production as at 30 June 1995**

<i>Commodity</i>	<i>Unit</i>	<i>Quantity in Current Year</i>	<i>Total Quantity</i>
<b>METALLIC MINERALS</b>			
Antimony .....	(tonne)	-	3
Bismuth .....	(kilogram)	-	110 080
Cadmium .....	(tonne)	-	5 155
Chromite .....	(tonne)	-	2 687
Cobalt oxide .....	(tonne)	-	165.3
Copper (blister) to 1918 (now shown under Silver and Copper) .....	(tonne)	-	169 273
Copper matte .....	(tonne)	-	6 326
Copper ore to 1918 (now shown under Copper) .....	(tonne)	-	42 439
Copper (from 1919) .....	(tonne)	33 281	1 171 434
Gold .....	(kilogram)	1 353	127 990
Ilmenite .....	(tonne)	-	558
Iron ore pellets .....	(tonne)	1 483 830	54 904 656
Iron in iron oxide (including hematite, limonite and magnetite) .....	(tonne)	113 698	1 435 055
Lead (from 1919) .....	(tonne)	54 453	1 206 496
Manganese .....	(tonne)	-	1
Manganese dioxide (from 1957) .....	(tonne)	-	13 521
Mercury .....	(kilogram)	-	7 697
Molybdenum .....	(tonne)	-	162
Monazite .....	(tonne)	-	34
Nickel .....	(tonne)	-	237
Osmiridium .....	(kilogram)	-	960
Pyrite (to 1971) .....	(tonne)	-	2 124 070
Pyrite (from 1972) .....	(tonne)	22 905	1 914 680
Rutile .....	(tonne)	-	1
Rutile (concentrates) .....	(tonne)	-	40 027
Scheelite (concentrates) .....	(tonne)	-	57 261
Silica for silicon alloy production .....	(tonne)	-	1 137 705
Silicon .....	(tonne)	-	36 987
Silver-lead ore to 1918 (now shown under Silver and Lead) .....	(tonne)	-	1 101 295
Silver (from 1919) .....	(kilogram)	146 172	3 853 104
Tin .....	(tonne)	7 416	322 521
Tungsten (as tungstic oxide) .....	(tonne)	39	35 280
Zinc .....	(tonne)	177 263	3 353 053
Zinc sulphate (from 1957) .....	(tonne)	-	4 306
Zircon (concentrates) .....	(tonne)	-	39 001
<b>NON-METALLIC MINERALS</b>			
Asbestos .....	(tonne)	-	4 044
Barite .....	(tonne)	-	2 240
Clay (from 1958) .....	(tonne)	120 570	4 804 568
Dolomite .....	(tonne)	41 969	483 081
Graphite .....	(tonne)	-	41
Kaolin .....	(tonne)	29 376	578 772
Limestone—			
Agricultural and other .....	(tonne)	120 767	2 992 599
Carbide .....	(tonne)	-	1 081 509
Cement .....	(tonne)	1 341 732	21 701 197
Chemical and metallurgical .....	(tonne)	31 272	6 296 359
Ochre .....	(tonne)	-	2 949
Pebbles (from 1957) .....	(tonne)	-	31 757
Sulphuric acid .....	(mono tonne)	347 150	6 625 893
Sand (moulding) .....	(tonne)	-	1 442
Silica .....	(tonne)	-	701 248
Talc .....	(tonne)	-	338

<i>Commodity</i>	<i>Unit</i>	<i>Quantity in Current Year</i>	<i>Total Quantity</i>
<b>FUEL MINERALS</b>			
Coal (run of mine) .....	(tonne)	675 981	19 552 548
Shale .....	(tonne)	-	42 239
Peat .....	(m <sup>3</sup> )	0	47 290
<b>CONSTRUCTION MATERIALS</b>			
Building stone-			
Freestone .....	(tonne)	340	33 380
Granite .....	(tonne)	987	135 871
Other stone .....	(tonne)	5 013	43 930
Sandstone (from 1993) .....	(tonne)	2 128	2 277
Crushed and broken stone (from 1958)-			
Basalt .....	(tonne)	941 033	20 210 816
Dolerite .....	(tonne)	1 101 407	33 568 815
Limestone .....	(tonne)	33 200	1 246 260
Sandstone .....	(tonne)	2 128	312 974
Other .....	(tonne)	206 836	11 620 862
Gravel (from 1958) .....	(tonne)	53 701	48 444 092
Sand (from 1958) .....	(tonne)	572 632	10 645 073
Other road-making material .....	(tonne)	1 335 356	15 438 207

## Value of the Tasmanian Mineral Industry

Year ended Commodity	Unit	30 June 1994 Total Quantity	30 June 1995 Total Quantity
<b>METALLIC MINERALS</b>			
Cadmium .....	(tonne)	0	0
Cobalt oxide .....	(tonne)	0	0
Copper .....	(tonne)	32 822	33 281
Gold .....	(kilogram)	1 350	1 353
Iron ore pellets .....	(tonne)	1 565 882	1 483 830
Iron (in magnetite) .....	(tonne)	111 991	113 698
Lead .....	(tonne)	71 752	54 453
Molybdenum .....	(tonne)	0	0
Pyrite .....	(tonne)	87 931	22 905
Silicon (metallic or as alloy) .....	(tonne)	0	0
Silver .....	(kilogram)	140 442	146 172
Tin .....	(tonne)	7 415	7 416
Tungsten as tungstic oxide .....	(tonne)	26	39
Zinc .....	(tonne)	165 934	177 263
<b>Value of metallic minerals .....</b>		<b>\$350 740 980</b>	<b>\$355 211 401</b>
<b>NON-METALLIC AND FUEL MINERALS</b>			
Clay—			
Cement .....	(tonne)	52 300	37 826
Brick .....	(tonne)	85 463	71 564
Other .....	(tonne)	12 270	11 180
Kaolin .....	(tonne)	40 034	29 376
Dolomite .....	(tonne)	26 069	41 969
Limestone—			
Agricultural .....	(tonne)	85 122	87 892
Cement .....	(tonne)	1 096 926	1 341 732
Chemical and metallurgical .....	(tonne)	29 773	31 272
Other .....	(tonne)	53 661	32 875
Sulphuric acid .....	(mono tonne)	361 959	347 150
Coal (run of mine) .....	(tonne)	564 282	675 981
Coal (washed) .....	(tonne)	316 047	275 157
Peat .....	(m <sup>3</sup> )	16 056	0
<b>Value of non-metallic and fuel minerals</b>		<b>\$38 732 242</b>	<b>\$40 663 714</b>
<b>CONSTRUCTION MATERIALS</b>			
Building stone—			
Freestone .....	(tonne)	460	340
Granite .....	(tonne)	1 555	987
Other .....	(tonne)	188	5 013
Sandstone .....	(tonne)	149	305
Crushed and broken stone—			
Basalt .....	(tonne)	665 629	941 033
Dolerite .....	(tonne)	1 276 237	1 101 407
Limestone .....	(tonne)	41 415	33 200
Sandstone .....	(tonne)	11 867	2 128
Other .....	(tonne)	214 511	206 836
Gravel .....	(tonne)	78 481	53 701
Sand .....	(tonne)	546 346	572 632
Other road materials .....	(tonne)	1 243 708	1 335 356
<b>Value of construction materials .....</b>		<b>\$27 088 140</b>	<b>\$28 617 468</b>
<b>TOTAL VALUE WITH AUSTRALIAN METAL PRICES .....</b>		<b>\$416 561 362</b>	<b>\$424 492 583</b>
<b>METALLURGICAL PRODUCTION FROM OTHER THAN TASMANIAN ORES</b>			
Aluminium .....	)		
Aluminium sulphate .....	)		
Cadmium .....	)		
Cobalt oxide .....	)		
Ferro-manganese .....	)		
Ferro-silicon .....	)	\$639 023 140	\$609 664 012
Silico-manganese .....	)		
Sinter .....	)		
Superphosphate .....	)		
Titanium dioxide .....	)		
Zinc .....	)		
<b>VALUE OF MINING AND METALLURGICAL PRODUCTION .....</b>		<b>\$1 055 584 502</b>	<b>\$1 034 156 595</b>
<b>REPORTED AVERAGE NUMBER OF EMPLOYEES<sup>1</sup></b>		<b>5033</b>	<b>4173</b>

(1) Not all operators report full details



TASMANIA  
DEVELOPMENT  
AND RESOURCES

**MINERAL RESOURCES TASMANIA**

PO Box 56 Rosny Park  
Tasmania Australia 7018  
30 Gordons Hill Road Rosny Park  
Tasmania Australia 7018  
Tel: (002) 338 333 Fax: (002) 338 338

