



MINERAL RESOURCES TASMANIA

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES

***A Division of the Department of
Infrastructure, Energy and Resources***

Annual Review 2003/2004

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Mineral Resources Tasmania

Mineral Resources Tasmania (MRT) is a Division of the Department of Infrastructure, Energy and Resources. The primary role of MRT is to ensure that Tasmania's mineral resources and infrastructure development are managed in a sustainable way now, and for future generations, in accordance with current government policy, partnership agreements, and the goals of *Tasmania Together*.

This role includes ensuring that there is a fair and sustainable return to the community when mineral or petroleum resources are developed, and includes the provision of information to local government and land management groups for geohazards, groundwater and construction materials.

— Mission —

- ❑ To contribute to the economic development of Tasmania by providing the necessary information and services to foster responsible land management, and mineral resource and infrastructure development, for the benefit of the Tasmanian community.

— Objectives —

- ❑ Benefit the Tasmanian community by an effective and co-ordinated government approach to mineral resources, infrastructure development and land management.
- ❑ Maximise the opportunities for community growth by providing timely and relevant information integrated with other government systems.
- ❑ Optimise the operational performance of MRT by developing the organisational structure to support the whole-of-government business processes.

— Activities —

Activities within the Division include:

- ❑ Collection, integration, interpretation, publication and presentation of geoscientific information.
- ❑ Collection, integration, interpretation, publication and presentation of information promoting Tasmania's mineral resource potential, and land stability and groundwater issues.
- ❑ Issue of legal titles to mining tenements, collation and recording of statistics relating to mining production, collection of fees and rentals, management of royalty regimes, and recording of mining tenements.
- ❑ Regulation of mineral and petroleum exploration in Tasmania, including offshore waters administered by the State, and the promotion of vacant areas available for onshore and offshore exploration.
- ❑ Environmental appraisal, monitoring and management of mining heritage and land access issues.
- ❑ Setting and monitoring of standards for both the performance of exploration activities and the technical reporting of exploration records and case histories.

— Major issues and initiatives for 2004/2005 —

- ❑ Continue upgrading data on the TIGER System.
- ❑ Continue the promotional program to encourage mineral exploration in Tasmania.
- ❑ Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- ❑ Complete the series of planning information maps with regard to groundwater.
- ❑ Continue the rehabilitation of abandoned mining sites in Tasmania.

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Mineral Resources Tasmania

— Divisional overview, 2003/2004

The mining industry in Tasmania again experienced difficult, but improving, conditions during the year. Commodity prices recovered in United States dollar (USD) terms throughout the year, but this was partly countered by a rise in the value of the Australian dollar. Towards the end of the year, a decline in the value of the Australian dollar had a significant effect on improving the profitability of mining operations.

This cycle was felt most strongly at the Renison Bell tin mine, which was under administration for the bulk of the year. Following a decision to remove dewatering pumps in January 2004, the Administrator of Renison Bell Limited announced in March that he had accepted an offer by Bluestone Nominees Pty Ltd to purchase the mine. The company is now restoring the mine's infrastructure and plans to resume production by the end of 2004.

All other major mines continued to perform strongly during the year. The Rosebery mine became part of a new company, Zinifex Limited, and is now operating without an Administrator. By year's end, major exploration programs were underway at the Henty, Beaconsfield, Rosebery and Mount Lyell mines, with encouraging results reported from Beaconsfield.

Allegiance Mining NL had developed an exploration decline at the Avebury nickel deposit to 110 metres by mid-June. The company plans to conduct a full feasibility study and development approvals in parallel to enable production to commence by the end of 2005.

An increase in the price of iron ore pellets has improved the viability of the Savage River mine and Australian Bulk Minerals is seeking a partner to enable the mine to continue as an underground operation in the future.

The Thylacine gas discovery in permit T/30P and the Yolla gasfield are both in Tasmanian waters and are to be

developed in the near future. The gas from both these fields will be piped to Victoria.

Internally, the major initiatives and issues affecting MRT in 2003/2004 included:

- Enhancing the provision of geoscientific data through the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system;
- Undertaking a series of promotional activities to encourage mineral exploration in Tasmania which was at a low level at the beginning of the year;
- Completion of a three-dimensional model of the geological structure and major mineralising pathways of Tasmania to provide new information for explorers;
- Completion of the second (final) phase of the Western Tasmanian Regional Minerals Program study; and
- Provision of an appropriate level of resources for the environmental monitoring of exploration and mining tenements, and for inspection of mines and quarries.

The major issues and initiatives for 2004/2005 are to:

- Continue upgrading data on the TIGER system;
- Continue the promotional program to encourage mineral exploration in Tasmania;
- Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster;
- Complete the series of planning information maps with regard to groundwater; and
- Continue the rehabilitation of abandoned mining sites in Tasmania.

Ten years of MRT achievements (1995–2004)

— a review of MRT's past successes and future directions

This year marks the tenth anniversary of my filling the role of Director, Mineral Resources Tasmania and State Chief Geologist. I wish to take this opportunity to publicly acknowledge, and sincerely thank, all MRT staff, both past and present, for their hard work and dedication, without which the successful accomplishment and delivery of the objectives set when I became Director of MRT in December 1994 could not have been achieved.

With the successful construction of the TIGER System (2003), the acquisition of numerous regional remote sensing data sets (1995–2002), and the development and distribution of the 3D geoscientific model of Tasmania (2004), MRT staff have delivered the three 'mega-projects' which were conceived in 1994/1995.

On accepting the position I set out to build a unified MRT which would be robust enough to continue into the future under the guidelines given by the then Tasmanian Government to 'go digital' with a 'print on demand' capacity, to increase mineral exploration investment in Tasmania, and to improve the information available for pro-active land management.

The outcomes of these aims were achieved by a series of projects conducted over the past ten years. The projects were originally defined in *Decade of Growth — Vision for Mineral Sector Growth — TASGEOL 2004* (Tasmanian Geological Survey Record 1995/12) and revised in *Vision for Mineral Sector Growth — TASGEOL 2005 — Phase 2* (Tasmanian Geological Survey Record 1999/02).

TASGEOL was originally devised in 1995, following on from the successful completion of the NETGOLD Project (1993/1994), as a nine-year development plan for upgrading geoscientific information on Tasmania as an incentive for increased investment in mineral exploration and effective land management.

Projects under TASGEOL 2005 were undertaken to:

- ❑ Develop a digital information management system to integrate, maintain and analyse geoscientific data on Tasmania and convert all existing hard-copy data into digital format for the system to use. This resulted in the TIGER System and development of digital databases for all geoscientific data on Tasmania. The system was completed at the end of June 2003 but it will take until at least June 2005 for all existing data to be converted.
- ❑ Obtain modern, high level remote sensing data over western and northern Tasmania. This has occurred with funding through the Regional Forest Agreement (RFA) process; the TASGO–TASMAP projects in collaboration with the Australian Geological Survey Organisation (AGSO) (now Geoscience Australia, GA); and the Western Tasmanian Regional Minerals Program (WTRMP).
- ❑ Integrate all existing geoscientific data into the information management system (TIGER System) so as to have one unified system (this will continue until at least the end of 2005).
- ❑ Develop a 3D geoscience model of Tasmania to define the basic building blocks and fluid paths forming the Earth's crust in Tasmania. This resulted in an initial 3D model based on the TASGO–TASMAP project data, developed in association with AGSO/GA. Tasmanian Government and WTRMP funding was then used to

build on this initial model by incorporating the best data then available to produce the 3D Geological Model of Tasmania in association with the pmd*CRG.

Specifically the following activities were successfully undertaken by staff at MRT. This list is not a comprehensive list of all activities undertaken by MRT over the period, but a list of those activities over and above those required to fulfil the legislative, regulatory and on-going government policy requirements.

- ❑ completion of the development of the TIGER System (Project TIGER);
- ❑ continuation of the development of digital databases and conversion of existing hard-copy geological maps into digital format;
- ❑ completion of the interpretation of data acquired during the WTRMP, data package development and promotion;
- ❑ production of a unified, 3D geological model of Tasmania;
- ❑ production and presentation of promotional material on Tasmania's mineral prospectivity;
- ❑ undertaking the first of four phases of a Tasmania-wide Landslide Hazard Risk Assessment Program;
- ❑ completion of conversion of all existing hard-copy geological maps from western and northern Tasmania (as far as the River Tamar) to digital format;
- ❑ continuing digital capture of outstanding geoscientific and open-file company data into the TIGER System; and
- ❑ production of a concise 'Tasmanian Mineral Prospectivity' promotional document.

MRT's Future — Responding to changing World community attitudes to the minerals industry, infrastructure development and environmental situations

Community expectations of the minerals industry are undergoing an unprecedented period of change due to a broad array of inter-related technical, social, and environmental issues. These expectations also include providing a fair return to the community for mining activities (royalty payments) and a non-negative environmental impact following mine closure, and, in many countries, involvement of indigenous people in mining projects.

The minerals industry has, over the past three to four years, been subject to many company mergers, de-mergers and consolidation, resulting in a reduction in the number of companies able to undertake future investment in greenfields exploration in Tasmania. As a consequence of these changes, minerals exploration is in a period of transition as it continues to face this broad array of changes.

Financial implications have increased as investors, indigenous people, local communities, non-governmental

organisations and other interest groups apply increasing scrutiny to exploration and mining operations. With global communications, local incidents can be rapidly broadcast worldwide.

Although government is not an 'explorer' or 'miner' it must be aware of, and ready to tackle, problems emerging due to the changing nature of the technologies used in mining and mineral extraction, the way mining companies are responding to changing conditions, costs and liabilities related to mine closure, and the challenge of managing mining's relationship with local communities. Basically, government must not only be aware but act on behalf of the community.

Society must continue to obtain the energy, mineral, and water resources that are needed to keep our economy going, whilst making sure that the industries associated with these resources are kept viable. At the same time government must ensure that responsible remediation of the effects of withdrawing these assets from the earth

(e.g. greenhouse gas sequestration, mine clean-up, management of salinisation, etc.) are undertaken.

This apparent paradox presents constantly changing issues and challenges that require a critical mass of earth scientists and support staff to be retained by the State. This is the contribution MRT makes to the community.

MRT, a Division of the Department of Infrastructure, Energy and Resources (DIER), is Tasmania's 'corporate asset' for geoscientific information. MRT has a multi-tasking workforce which undertakes activities ranging from regulatory functions to innovative geoscientific projects, with the aim of attracting mineral explorers and exploration dollars to Tasmania and regulating the industry.

MRT needs to continue to provide corporate information for facilitating strategic infrastructure development and allowing land management to be undertaken in a sustainable way now, and for future generations, in accordance with current government policy, partnership agreements and the goals of *Tasmania Together*.

MRT must also continue to carry out all activities using the philosophy enunciated in DIER's charter, *The Will and The Way*. This charter has two aspects: *The Will*, which is about how we undertake our activities; and *The Way*, which is about what we do. Therefore MRT undertakes consultation and information activities to ensure end-users and stakeholder's needs are identified and considered during decision-making processes.

Through its promotional program, and face-to-face meetings with companies, MRT gains direct feedback from end-users in relation to their data needs to encourage exploration in Tasmania. It also works very closely with a number of local, state and commonwealth bodies, including a close working relationship with the University of Tasmania's Centre for Ore Deposit Research (CODES-SRC), which continues to conduct applied research of value to the Tasmanian minerals exploration and mining industries.

Another vital area of information is obtained through consultation with colleagues from all areas of DIER so as to draw on the diversity of skills and experience in the organisation and to bring about integrated outcomes. MRT is currently involved in providing geological, land stability and rock type variation data to other divisions in the Physical Infrastructure Group for the planning of roads and linear infrastructure, and to ensure access to minerals is not restricted by future developments.

MRT has developed a philosophy of being innovative and willing to take sensible risks. It supports the existing commercial and social structure of Tasmania by the delivery of information to the public and commercial sectors, via the TIGER System, and ensures that land stability data is available to local government, thus providing a framework for facilitating new development to contribute to the economic and environmental development of Tasmania.

The TIGER System provides regional, high-quality, geoscientific information essential for servicing the minerals and petroleum exploration sectors, and to local government and land management groups for geohazard

risk mitigation, groundwater delineation and quality control; and for the understanding of construction materials to aid in infrastructure development. The TIGER System is a single, state-of-the-art, comprehensive information management system which allows the capture, storage, maintenance, integration and delivery of geoscientific and mineral tenement data to anyone who requires the information.

In pursuing these objectives we are aiming to ensure the effective integration of the key infrastructure serving the community. This comprises our physical transport and energy assets (for example roads, bridges, ports and powerlines), our information systems capturing, maintaining and providing data (for example in transport, mining and forestry), and the policy environment and regulatory systems in which business is conducted.

The future role of MRT will be directed towards:

- encouraging new greenfields exploration by continuing to provide and promote new geoscientific data to extend and upgrade areas of mineral potential;
- encouraging exploration activities and the development of non-metallic mineral resources;
- continuing to enforce high environmental standards for exploration and mining activities;
- providing information which helps mitigate the risk of damage from natural hazards;
- providing a framework within which geoscientific information can be developed to contribute to the economic, social and environmental development of Tasmania;
- developing programs to promote Tasmania as an area with low sovereign risk for new investment opportunities; and
- developing strategies to combat the perception that Tasmania is a green lockup.

MRT is currently providing, or is gearing up to provide, information on all of the issues raised, albeit in a financially-constrained manner. MRT already provides geoscientific information for a wide range of end-use but mainly for minerals exploration, geohazard risk assessment and groundwater distribution and quality. Tasmania is also considered to have a tenement system which is transparent, fair and secure.

Over the past 20 years the Tasmanian Government has paid out over \$20 million (in 2004 values) in purchasing houses which have been damaged by landslide activity. Proper planning and regional geoscientific studies to identify regions subject to geohazards, as is being undertaken in most European countries, can save further financial outlays. Similarly, geoscientific data can also be used as a catalyst to attract further investment in mineral exploration by companies in Tasmania by increasing our knowledge of Tasmania's mineral prospectivity.

Tasmania is resource and agriculturally focussed and much more exposed to international competition than other more industrialised States. This means that any industry policy for Tasmania needs to be attuned to the needs of export

industries and recognise the requirement for international competitiveness.

Tasmania cannot ignore the realities of competing in a global market, it is not an option.

For a sustainable future for the minerals industry in Tasmania the government will need to focus its industry policies so that it commits to the development of industries which utilise the resources, skills and ingenuity in the mining and natural resource industries based in the State.

Tasmania's west coast is a well recognised mineral-rich area. As well, Tasmania has a low sovereign risk profile, and access to growing Australian and Asian markets. Access to greenhouse-friendly renewable electricity power is also a positive factor.

For society to continue with the present standard of living it must continue to access the energy, mineral, and water resources that are needed to keep our economy going, whilst ensuring that the industries associated with these resources remain viable.

For mining to be sustainable it must not only contribute to the economic growth of the State and specific regions, but the industry must also accept responsibility for environmental and cultural impacts. There is a need for a range of local economic activities in a mining area that can endure when the mineral deposit is depleted.

It is the role of government to collect regional geoscientific data so that sensible land management decisions can be made in regard to the minerals industry, infrastructure planning, land stability, salinity issues and the sustainable use of groundwater.

There is a need to encourage both the development of mineral resources and the protection of the environment, as well as demonstrating that economic benefits of mining can, and should, be achieved without a long-term detrimental effect on our natural environment.

This then leads to a requirement to continue obtaining new geoscientific data, as, to a greater degree than most other developed nations, Australia's ability to maintain a sustainable society requires solutions that arise basically from geoscientific information.

Another priority is to continue to carry out rehabilitation work on abandoned mine sites for which no individual or company can now be held responsible. Activities in this area should concentrate on improving community safety and on re-establishing local environmental conditions, and where possible, contributing to future uses of the site such as tourism and mineral specimens collection.

The current government accepts that sustainable development of mineral resources and new value-adding processes can only occur in partnership with local communities, and that this will result in continued economic growth and the maintenance of jobs in the industry and in surrounding regional communities.

Geoscience investigates the records of our past to produce a blueprint for our future. It:

- provides the resources for maintaining our lifestyle;
- helps us keep our communities safe from hazards; and,
- is critical for the protection of our unique environments.

If the above points are accepted, then the future goal for MRT is to provide a framework within which geoscientific data can be obtained and developed to contribute to the economic, social and environmental development of Tasmania.

This will mean that the main role of MRT will be to collect, integrate, maintain and make available information on Tasmania's geoscientific endowment, through the TIGER System, to facilitate infrastructure development and better land management and to continuing to promote Tasmania's mineral prospectivity. Other roles include administration of mineral tenements and ensuring that there is a fair and sustainable return to the community when mineral or petroleum resources are developed.

This should then lead to the following outcomes that will help fulfil the *Tasmania Together* Goal 20, that is to "Promote our island advantages including our 'clean-green' image, natural resources, location and people" by:

- improving public awareness of geoscientific data being applied to solving day-to-day problems, such as providing natural hazard risk assessment, as well as to the minerals area;
- demonstrating how geological understanding can aid in assessing environmental risk;
- improving how we apply geoscientific information to maintain our land and water quality;
- improving co-operation between agencies, including the development of more effective structures; and
- defining priority areas for the gathering of new geoscientific data to increase the understanding of mineral prospectivity across Tasmania.

There are a number of negative attitudes within mineral exploration companies which will also have to be addressed. These include:

- Mature provinces are the hardest to attract greenfields exploration to; exploring in Australia is challenged by the fact that most mining districts are mature.
- A cynicism within large mining houses that results in them avoiding greenfields exploration under the false assumption that if you are not the first or second explorer, you are probably too late.
- Pressure on the exploration industry to be more cost effective; this is starting to drive industry offshore to immature/high-risk regions with the possibility of high rewards. With the move to offshore regions Australia could soon be the only first-world country without a vibrant, economic, geoscience and mining university sector.

Specifically for Tasmania, the negative issues include:

- negative perceptions of the location of resources (e.g. wet and rugged terrain, hard to work in); and
- negative perceptions of the sector (old technology, dirty, environmentally unfriendly, green lockup).

There is a need to be innovative and to try new concepts and technologies, so that the work undertaken by MRT helps to progress activity and to negate an attitude that Tasmania is a 'mature' exploration province. There is a

need to get companies to re-assess the potential of Tasmania.

Overall, Australia is considered to be a 'mature' exploration environment, but both Newcrest Mining (in NSW) and Minotaur Resources Ltd (Prominent Hill in SA) have recently discovered large, previously unknown deposits in areas considered to be 'mature'.

The 'old' days (pre-1993) of unrestricted field mapping and associated applied research projects are no longer considered priority areas for the spending of public funds. Following the 1993–1996 restructuring of MRT, government policy directed that all geoscientific applied research activities were now to be a function of the CODES-SRC, at the University of Tasmania, and project funds were, and still are, allocated in the budget process for the CODES-SRC to undertake such research in co-operation with MRT.

Day-to day activities now include digitisation of data and the maintenance of information in the TIGER System. Office-based activities, such as collating new information and upgrading and converting older information into digital formats, are a key part of MRT's on-going work, as is maintaining the TIGER System. Until all data are converted into digital format and integrated into the corporate information management system they cannot be assessed, and priority areas for upgrading old information cannot be presented for new initiative funding.

Future MRT core activities will vary with time and be defined by MRT, in consultation with our client base, to undertake projects prioritised in line with government priorities and policy outcomes as defined by *Tasmania Together* and Partnership Agreements with local government. Activities will not be defined by what was 'traditionally done' in the 1960s to 1980s, as government now has different priorities due to changing community needs.

In the immediate future MRT will undertake a gap analysis of the 3D model of Tasmania and define new strategic data collection projects, to enhance existing databases and improve understanding of the geoscientific parameters that constitute Tasmania, for consideration of funding through the budget process. This is envisaged to occur during 2004/2005, with applications for project funding from 2005/2006 onwards. The level of activity will depend on the level of available resources.

MRT will also complete the conversion of all existing hard-copy geological maps from northern (east of the River Tamar) and eastern Tasmania to digital format and develop strategic data-gathering projects based on mineral systems or geological provinces, with yearly outputs and promotion for eastern and western Tasmania.

Overall, Tasmania is in a good position with regard to some areas of basic geoscientific data. This is facilitated by the TIGER System and allows pre-competitive and company exploration data on Tasmania to be integrated, analysed and be available to all via the World Wide Web.

The future direction of MRT with respect to data gathering will depend on a number of factors, some totally outside our influence. An example of this is the three-pronged approach put in place by the Ministerial Council on Mineral and Petroleum Resources (MCMPR) to determine the best way to lift falling investment in greenfields exploration in Australia.

The MCMPR has commissioned the Standing Committee of Officials to develop a long-term vision for the minerals and petroleum sectors; commissioned the Chief Government Geologists Committee to develop a mineral promotion marketing plan, initially for 2003/2005, but able to be annually reviewed; and endorsed the Mineral Exploration Action Agenda (MEAA) established by the Commonwealth to reinvigorate mineral exploration in Australia. At present the MEAA initiatives have failed to gain support for funding through the Commonwealth Government's budget process.

MRT needs to have new projects ready to take advantage of any Commonwealth funding assistance which may become available under the Mineral Exploration Action Agenda.

In summary, MRT's future roles include:

- ❑ the provision of information to local government, infrastructure developers and land management groups for geohazards, groundwater and construction materials;
- ❑ tenement management;
- ❑ geoscientific data gathering, maintenance and delivery; and
- ❑ the promotion of Tasmania's mineral prospectivity.

In undertaking these roles, MRT will ensure that end-user and stakeholder needs are considered when making decisions on divisional priorities, by maintaining regular contact with individuals, interest groups and companies in the minerals industry, local government, university, and the public at large.

Again, my sincere thanks to the staff of MRT who have made, and will continue to make, a contribution to the economic, environmental and social well being of Tasmania.

Dr A V (Tony) Brown

Director of Mines and State Chief Geologist

Financial Performance

The 2003/2004 consolidated fund appropriation to Mineral Resources Tasmania was \$5.778 million. This funding consisted of:

- \$3.441 million for salaries for 55 full-time-equivalent staff, plus 4 temporary staff;
- \$1.919 million for operating expenditure including rent; and
- \$0.418 million for administered payments (\$350,000 Restoration of Degraded Mineral Lands and \$68,000 grant for the Tasmanian Government Mining Scholarships at the University of Tasmania CODES-SRC unit).

The total operating budget remained largely unchanged for 2003/2004. The division received funds for salary indexation negotiated under the State Service Wages Agreement, although this was partly offset by the imposition of budget management strategies. MRT's operating budget was cut by \$50,000 in 2003/2004, with a further \$50,000 cut required for 2004/2005 to meet the budget management strategy of \$100,000.

MRT had other State funding sources for 2003/2004, with the carry forward of Infrastructure Funds to complete Project TIGER and a landslip risk assessment project. This carry forward amounted to \$168,000. MRT also received funding of \$100,000 under the Social Infrastructure Fund for additional work on the 3D model. Further details of these projects are included in this report.

In 2003/2004 MRT completed work on the Western Tasmanian Regional Minerals Program. This was a Commonwealth-funded project totalling \$5 million. The project was largely completed in 2002/2003, although \$183,000 was carried forward into 2003/2004 to complete the project.

MRT continues to keep a tight control over expenditures to ensure that the division gets value for its limited funding.

Tasmanian government agencies are funded on an outputs basis. The outputs represent the goods and services delivered by MRT, and the cost of delivering those services. The government purchases these goods and services to meet policy objectives. The total output figure does not equal the consolidated fund appropriation available to the division due to the fact that overheads associated with head office are loaded into outputs.

MRT has two outputs for general operating and two for administered payments.

Outputs — Application of funds, 2003/2004

	\$'000
1. Minerals exploration and land management	3,084
2. Tenement management of the exploration and minerals industry	2,661
3. Centre for Ore Deposits Research	68
4. Rehabilitation of Degraded Mineral Lands	350
Total	6,163

Descriptions of Outputs and Outcomes, 2003/2004

1. Minerals exploration and land management

This output covers:

- the provision of geoscientific data and resource information on Tasmania's metallic, industrial, and hydrocarbon mineral endowment;
- promotion of mineral potential for the stimulation of exploration for metallic and industrial minerals and hydrocarbons; and
- geoscientific database development, maintenance, output and marketing, including the production of digital geoscientific maps and associated databases.

This will have the resultant outcome of dynamic minerals exploration and land management for Tasmania and offshore waters.

2. Tenement management of the exploration and minerals industry

This output provides for:

- the provision of geoscientific information essential for the effective and sustainable management of land and mineral resources;
- provision of advice to all levels of government and the public on land management issues;
- administration of mining legislation, including the issue of legal titles for mineral tenements;
- collation and recording of statistics relating to mining production and exploration; and
- the demand and monitoring of the collection of fees, rentals and royalties.

This will have the resultant outcome of effective and efficient tenement management of the exploration and minerals industry.

Revenue from fees and charges

Mineral Resources Tasmania collects royalties and rents and fees from mineral lands. These revenues are forwarded directly to consolidated revenue and are not available to MRT, except for offshore petroleum revenues which are utilised to administer the *Petroleum (Submerged Lands) Act 1967*.

Mineral royalties totalling \$9.0 million were collected during the 2003/2004 financial year. Royalty revenues improved markedly this year due mainly to improving commodity prices and better operating conditions at the mines. Strong demand for commodities from China resulted in strengthening commodity prices, although the rising value of the Australian dollar negated a lot of the price rise once the USD priced commodities were converted back to the local currency. The situation did improve towards the end of the year with the Australian dollar reducing in value and finishing the year below USD 70 cents. Revenues for 2004/2005 should again be higher

due to the resumption of operations at the Renison tin mine, and the continuing higher prices for commodities.

Individual mine reports in this review discuss production and profitability of mining operations.

Rents and fees from mineral lands raised \$0.942 million in 2003/2004, which was well above budget due to a significant upsurge in exploration licence applications.

Increased revenues for petroleum rents and fees are expected in 2004/2005 due to a major lease holder making two rental payments in that year. Revenues are then expected to go back to the 2003/2004 target figure.

	<i>Target</i>	<i>Actual</i>	<i>Target</i>
	<i>03/04</i>	<i>03/04</i>	<i>04/05</i>
Royalties (\$,000)	7,000	8,979	9,000
Rents and Fees (\$,000)	721	942	741
Rents and Fees — Petroleum (\$,000)	169	231	310
Sales of Maps and Publications (\$,000)	13	14	14

Royalty assessment

MRT is responsible for the collection of mineral royalties from Crown Land tenements. Royalty is not a tax but a payment to the community for the purchase of non-renewable resources from the State.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the legislation. The audit program mainly concentrates on the metallic mines which pay royalty based on net sales and profits. Metallic mines pay the vast majority of royalty revenue.

The Tasmanian royalty regime operates under two systems depending on the type of resource recovered. Companies producing a metallic mineral or coal pay under a two-tiered

regime where royalty is paid on the net sales and the profit from a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a per cubic metre or per tonne basis.

The two-tiered metallic and coal royalty consists of an ad valorem percentage payable on net sales, and a formula-based percentage of profits. This system requires mining companies to pay a fixed percentage of sales in royalty for ore extracted, and allows the community to benefit further in good times when a company is making a profit.

Following negotiations with the mining industry, new royalty rates were approved in August 1997, with the regime taking effect from 1 July 1997. Non-metallic rates increased from \$1.00 per cubic metre to \$1.20 per cubic metre, while it was agreed that metallic mineral and coal royalties would be increased incrementally over a number of years to the current full level.

The ad valorem rate for net sales is 1.6%. The profit component of the royalty regime is calculated via an exponential formula which increases the percentage of profit royalty paid as the mine's profit increases.

A royalty cap of 5% of net sales has been set so that high-cost, short-life mines are not discriminated against.

Mining companies that expand into downstream processing to produce a near pure specific metal can apply to the Treasurer to receive a 20% rebate on royalties payable. Companies that produce gold doré can apply to claim a 10% rebate on royalties.

The Treasurer has the discretion to increase the gold doré rebate to 20% depending on criteria such as the magnitude of investment undertaken and the benefit to the Tasmanian economy from the investments.

Major contracts awarded over \$50,000

<i>Contractor</i>	<i>Location</i>	<i>Tender</i>	<i>Period of contract</i>	<i>Estimated value of tender (\$)</i>
ECS International	Mittagong, NSW	Capture of analogue aeromagnetic data	28/8/2003–31/12/2003	55 500
Joe Fagan Heavy Haulage	Waratah	Mt Bischoff rehabilitation	1/8/2003–31/7/2004	104 100

Consultancies over \$50,000

<i>Consultant</i>	<i>Location</i>	<i>Tender</i>	<i>Period of contract</i>	<i>Estimated value of consultancy (\$)</i>
Pitt & Sherry	Hobart/Devonport	Mt Bischoff rehabilitation	1/12/2003–30/11/2004	71 400

Consultancies less than \$50,000

<i>Consultant</i>	<i>Description of consultancy</i>	<i>Value of consultancy (\$)</i>
Geometry P/L	Project TIGER: Development of samples and geochemistry system	44 000
Geometry P/L	Project TIGER: Development of sample information import-export facility	22 800
Corbettas Enterprises P/L	WTRMP: Preparation of geological coverages of Mt Read Volcanics for digital capture	12 240
Collins Earthmoving (Tas) P/L	Mining Lands Rehabilitation Trust Fund — earthworks for Balfour project	20 000
North East Excavations (Tas) P/L	Mining Lands Rehabilitation Trust Fund — earthworks for St Helens project	15 000
Resource Info	Capture of geological compilations — Railton, Sheffield, Latrobe	2 695
Resource Info	WTRMP: Capture of geological compilations — Teepookana, Strahan, Professor, Mallanna	3 355
Resource Info	WTRMP: Capture of geological compilations — Loyetea, Castra, Kindred, Ulverstone, Burnie, Stowport, Riana	5 841
Resource Info	WTRMP: Capture of geological compilations — Ahrberg, Cradle, Hardwicke, Interview, Liena, Mole Creek, Will	6 809
Data Vision	WTRMP: Capture of geological compilations — Teepookana, Strahan, Professor, Kelly	4 818
Data Vision	WTRMP: Capture of geological compilations — Castra, Kindred, Ulverstone, Burnie, Stowport, Riana, Loyetea	3 630
Coffey Geosciences Pty Ltd	Peer review of Hobart landslide hazard map	13 038
Corbettas Enterprises P/L	WTRMP: Preparation of geological coverages of Mt Read Volcanics for digital capture	15 000
Data Vision	WTRMP: Capture of geological compilations — Cluan, Westbury, Parkham	3 360
Resource Info	WTRMP: Capture of geological compilations — Ahrberg, Cradle, Hardwicke, Interview, Liena, Mole Creek, Will	6 809
Data Vision	WTRMP: Capture of geological compilations — Interview, Hardwicke, Cradle	2 230
Treloar Transport	Rehabilitation earthworks at The Badgers, Sheffield	16 390
Treloar Transport	Adit closure, Round Mount	8 785
Nigel Bedford	Rehabilitation supervision at The Badgers, Sheffield	2 200
LBD Project Services	Mt Bischoff safety program planning	10 736
Technical Advice on Water	Storys Creek water monitoring	11 935
Virotec Global Solutions	Rossarden revegetation trial	11 000
Pitt & Sherry	Taroona landslide monitoring	5 000
Peter Binny	Landslide monitoring	2 923
Leaman Geophysics	Landslide hazard map review	1 980
Forest Contractors	Landslide hazard map review	825
SEMF	Assessment of tenders for statutory maintenance for the Rosny and Mornington complexes	4 279

2003/2004 Performance Indicators

Growth in mineral exploration activity is essential for future development of the mineral sector and for the economic well being of Tasmania. Exploration activity is underpinned by updating and providing high quality geoscientific data relating to Tasmania's mineral resources. The activities of MRT are directed at the capture, storage and promotion of such information, with the increased availability of this information being measured and correlated with exploration investment. Enhancement of geohazard information is also of high importance to stakeholders of MRT, as is the effective administration of MRT's regulatory framework.

Achievement against internal targets

<i>Action</i>	<i>Target</i>	<i>Result</i>
Provide new data in areas with inadequate geoscientific coverage.	<ol style="list-style-type: none"> 1. Collection of at least 200 km² of primary digital geoscientific coverage per year. 2. Production of digital geoscientific coverage of ten 1:25 000 scale map equivalents per year. 	<ol style="list-style-type: none"> 1. No primary digital geoscientific coverage collected; resources utilised on WTRMP interpretation. 2. Forty 1:25 000 scale maps produced. Work on seamless 1:25 000 scale coverage of Tasmania continued.
Research and promotion of exploration of Tasmanian petroleum basins.	Promote one offshore area per year.	Eight offshore areas released and promoted at the APPEA and AAPG conferences.
Promote the geoscientific and mineral endowment aspects of Tasmania at various shows, industry conferences, press conferences, open days and other events.	Successful and timely presentation of promotional material at appropriate venues.	Direct promotional visits were made to companies in Canada and Australia. PDAC conference attended in Canada and <i>Mining 2003</i> conference attended in Brisbane.
Prioritise and organise rehabilitation works on abandoned mining lands in compliance with the operation of the Abandoned Mining Lands Rehabilitation Trust Fund.	One major program to be completed each year.	Programs at former mine sites at Balfour, St Helens and Storys Creek were completed. Work continues at Mt Bischoff.
Monitor environmental performance on exploration and mining tenements.	Field inspections as required.	Regular field inspections conducted. Functional requirements of compliance auditing system documented.
Digital geoscientific coverage of Tasmania's geohazards.	Completion of one map per year.	Four landslide hazard classification maps of the greater Hobart area were produced. The existing landslide advisory zone maps of the Launceston area and the Northwest Tasmania Land Stability maps were upgraded.
Digital geoscientific coverage of Tasmania's groundwater resources.	Completion of one map per year.	Tasmania Groundwater Flow Systems Map produced.

Achievement against external targets

<i>Target</i>	<i>2003/2004 result</i>	<i>2002/2003</i>
Increase exploration expenditure and maintain level at 2% of total Australian exploration expenditure.	Exploration expenditure increased to \$7.6 million in 2003/2004, with Tasmania's share of Australian expenditure increasing to 0.97%.	0.59%
Increase level of exploration expenditure to a minimum of \$30 million per financial year.		\$4.3 million
Obtain an increase in the area held under Exploration Licence.	Area held under All Minerals and Non-metallic Exploration Licences increased to 10 063 km ² . A further 60 826 km ² is held for onshore oil exploration.	8391 km ²
Obtain an increase in the number of Exploration Licences granted.	The number of Exploration Licences held increased to 141.	127
Obtain an increase in the percentage of Strategic Prospectivity Zones (SPZ) held under EL's.	The percentage of land in SPZ areas held under EL's increased to 9230 km ² .	6943 km ²

Mineral Resources Tasmania — Legislation and Committees

Legislation administered

- Mineral Resources Development Act 1995
- Mining (Strategic Prospectivity Zones) Act 1993
- Petroleum (Submerged Lands) Act 1982
- Iron Ore (Savage River) Deed of Variation Act 1990

Statutory bodies

- Nomenclature Board

Non-statutory bodies

- Ministerial Council for Mineral and Petroleum Resources (MCMPR) and associated Standing Committee of Officials, Task Forces and Working Groups
- ABS Mining Statistics User Advisory Group
- Australian Society of Exploration Geophysicists Data Standards Committee
- Australian Urban Regional Information Systems Association (AURISA)
- Chief Government Geologists Committee
- CODES-SRC Advisory Board
- DPIWE Application Assessment Panel
- Evaluation of Geoscience Australia's Geoscience Survey and Research Activities
- Government Geoscience Information Policy Advisory Committee and associated Working Group
- Crown Land Assessment Working Group
- Groundwater Coordination Committee
- Inter-Departmental Oceans Policy Working Group
- Land Information Coordination Committee (LICC)
- LICC Sub-committee — The List Management Advisory Group
- Mineral Exploration Working Group
- Mineral Resources Industry Advisory Panel
- Mining Heritage Committee
- National Groundwater Committee
- Tasmanian Statistical Advisory Committee

Mineral Resources Tasmania — Branch Activities, 2003/2004

During 2003/2004 Mineral Resources Tasmania consisted of five branches: Metallic Minerals and Geochemistry; Industrial Minerals and Land Management; Information Systems and Geophysics; Data Management; and Royalty, Finance and Administration.

Because of the integrated nature of the branches, outputs provided under the banner of the Tasmanian Geological Survey are contributed to by staff of all branches.

Metallic Minerals and Geochemistry

During 2003/2004 the Metallic Minerals and Geochemistry Branch was involved in a number of projects and programs. Emphasis was placed on preparing geological information for digital capture and upgrading of databases for delivery of data via the world-wide web.

Western Tasmanian Regional Minerals Program (WTRMP)

Planning of projects was done in conjunction with Commonwealth Government, industry and MRT personnel.

Two reports on field checking of features in the aeromagnetic and radiometric data in northwest Tasmania were close to completion at year end.

The study to recompile and synthesise the geology of Tasmania's main mineralised rock suite, the Mount Read Volcanics (MRV), was completed, with the presentation of a general geological legend for the MRV and a critique on the 1:25 000 scale geology with suggestions for amendment of rock unit assignments. The way was prepared for completion of the upgrade of the geology of the MRV by a contract geologist preparing information from the remaining areas for digital capture.

The final two reports on the mineral potential of Devonian granite aureoles were received from consultants. These focussed on areas in northwest and central north Tasmania.

The interpretation of data from the HyMap hyperspectral remote sensing mineral survey of the Queenstown region was completed by the CSIRO following ground validation of mineral mapping interpretations by CSIRO and MRT personnel, partly in conjunction with a Ph.D. student from CODES-SRC.

Upgraded data and images from the Pacrim II radar survey of part of western Tasmania were received from NASA.

Three-dimensional geological model of Tasmania

The then Deputy Premier launched the three-dimensional geological model and prospectivity analysis of Tasmania on 17 October 2003. A regional study of this magnitude and detail was a world's first. Following minor correction, the model was distributed on 1 April 2004.

The model involved the input of mine-scale data from the mining industry. The project was co-ordinated by the

Predictive Mineral Discovery Cooperative Research Centre (pmdCRC) based at the University of Melbourne, which subcontracted Geoinformatics Exploration Limited to produce the visual model based on information supplied by pmdCRC and MRT personnel.

The project established a new benchmark for industry-government co-operation and involved integration of regional-scale data, provided mainly by MRT, with detailed information from the major mines, generously provided by mine management to be incorporated in the model. The Centre for Ore Deposit Studies (CODES) at the University of Tasmania was contracted to produce digital maps of volcanic associations and rock alteration mineral assemblages to be incorporated in this model.

The model was extensively promoted during the latter part of the year and has received wide praise for its comprehensiveness and innovation.

Geoscientific data generation

The generation of new primary geoscientific data was suspended to enable focus on the capture of existing data into digital formats, and to enable completion of the three-dimensional geological model and Western Tasmanian Regional Minerals Program projects.

Fifty geological map sheets were prepared for digital capture by the Branch during the year (Devonport, Latrobe, Railton, Sheffield, Calder, Yolla, Studland, Mallanna, Professor, Bellinger, Strahan, Kelly, Teepookana, Liena, Mole Creek, Montana, Cluan, Deloraine, Westbury, Parkham, Bridgenorth, Burnie, Stowport, Riana, Loyetea, Ulverstone, Kindred, Castra, Cradle, Will, Goulds, Collingwood, Loddon, Bridport, Tam O'Shanter, Waterhouse, Tomahawk, Lyme Regis, Musselroe, Naturaliste, Eddystone, Ansons Bay, The Gardens and Binalong). Of these, 31 sheets were prepared by a contract geologist working on a WTRMP project. The Yolla and Calder sheets included limited field checking and incorporation of interpretations of WTRMP geophysical data, while the Studland sheet included geological interpretation of the geophysics.

Branch members are involved in a co-operative project with Geoscience Australia and an expert consultant to define the mineral potential of Tasmanian granites and surrounding rocks as part of a broader study of eastern Australia.

Database development

The main work of the branch for the year involved the development of database structures for the TIGER System and the verification and capture of data for incorporation in the new system.

A total of 20,386 records in the drill holes module were verified, completing quality assurance of the database. There are 743 records that lack references and were not verifiable.

The TASROK and ROKSTOR databases for MRT rock samples were merged into a database of over 30,000 MRT samples. Migration into an Oracle database and preparation of business rules have been advanced.

Approximately 25% of the mineral deposits database has been verified and corrections have been made to the database structure.

Geochemical data have been successfully migrated to the Oracle platform.

Information for the Australian Spatial Data Dictionary was updated.

Core library

A successful application was made for Capital Investment Program funding to extend the Mornington core library in 2004/2005.

The level of usage of the core library continued, with 52 visits during the year to inspect drill core.

Large volumes of core continue to be sent by companies to the Mornington core library. At one stage, there was a potentially serious situation with major amounts of core from the Renison Bell and Hellyer mine leases possibly needing accommodation at Mornington. Core transfer from Renison Bell was underway when the sale of the mine was announced. Following discussions with the new owners the core was returned at their expense.

The core library supervisor again visited the West Coast to inspect core that will be transferred to MRT in the future.

Mineral exploration and other promotional activities

Promotional missions were conducted to Perth in June 2003 and to Sydney and Brisbane during May 2004. Promotional displays were held at the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) in Toronto in March 2004, and at the *Mining 2003* trade show in Brisbane in November 2003. Pre- and post-convention visits were made to companies in Toronto and Vancouver as part of an Australian delegation and also with a Tasmanian team.

These activities were well received and resulted in applications for exploration licences.

There was also evidence that the three-dimensional geological model and prospectivity analysis of Tasmania, and data generated by the Western Tasmanian Regional Minerals Program (WTRMP) and the TIGER Project, were stimulating exploration licence applications, especially in western Tasmania. A large number of visitors

to MRT were shown the 3-D model and displays produced relevant to their areas. Parts of the prospectivity analysis were incorporated in an information memorandum produced by Intec Limited to attract joint venture partners to conduct exploration in the Hellyer mine area.

Articles, promotional material and information on mineral prospectivity and exploration activities in Tasmania were prepared for various specialist mining journals.

Several branch members made contributions to displays held at the Burnie, Hobart and Launceston shows. In addition, the petrologist conducted displays and publication sales for the National Gemmological Symposium, held in Hobart, and presented talks at schools.

A successful promotional display was held at the *24-carat Gold* symposium held in Hobart in June 2004.

Petrology

The petrologist supervises the petrological and lapidary laboratories, which service internal and external clients, as well as managing or supporting several projects and databases. He is also involved with projects and general exploration administration.

The lapidary and petrology laboratories provided a total of \$24,064 worth of analyses and services to the Department of Infrastructure, Energy and Resources (DIER) (\$6,325) and external clients (\$17,739). Most of this external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 167 standard thin sections and 19 polished thin sections, making a total throughput of 186 samples. Most of these were done on an as-needed basis by the field assistant; this work was valued at \$4,460.

The technical officer for petrological services processed 313 samples by X-ray diffraction, including 175 quantitative dust analyses. He also conducted 47 soil and sizing tests and 70 optical asbestos identifications, a total of 430 samples processed, valued at \$19,604. About half of his time was spent preparing samples for, and operating, the XRF for the Geochemistry Section.

A total of 345 external (contract) samples were received for investigation, mostly by X-ray diffraction. These samples included 247 for occupational health clients, 46 soils, seven construction materials, 14 industrial samples, two forensic samples, 20 general rocks and 29 other samples. This external work came from a wide range of external sources, including the Transport and Workplace Safety branches of DIER, Tasmania Police, Hydro Tasmania, the Department of Primary Industries, Water and Environment and other government departments, the University of Tasmania (staff and students), various mining, mineral processing and mineral exploration companies, environmental and occupational health consultants, geotechnical and soil testing companies, the general public and miscellaneous businesses.

Samples studied include geological materials (construction materials, mineral concentrates, ore samples, rocks, soils, sands and clays), fish products and anthropogenic materials (including forensic samples, concretes, asbestos sheeting,

industrial materials, dusts, acid drainage, etc). Forensic studies continued with work for Tasmania Police.

The soil laboratory has been closed due to accommodation pressures at Rosny. The equipment has been redistributed between various laboratories, allowing soil investigations to continue.

The petrologist, as official radiation safety officer, has overseen some radiation storage, X-ray equipment safety inspections and other safety issues. Laboratory safety audits are underway.

The petrologist is helping update the Tasmanian gemstone booklet and posters, and update the list of designated fossicking areas. The *Catalogue of Mineral Occurrences in Tasmania* has been updated. The petrologist also handles numerous public and commercial enquiries on all manner of mineral, mining and rock-related matters, particularly in regard to mineral locations and identification, occupational health issues, and mine locations. The petrologist is also curator for MRT's rock and mineral specimens.

Geochemical laboratory

During 2003/2004 the laboratory was staffed by a senior chemist and a technical officer. A geologist/geochemist and another technical officer provided part-time assistance. Although our sample preparation technician does most of the water analyses, the laboratory is undermanned due to the absence of a specialist chemist/technician in instrumental/wet chemistry. Absence or leave of any personnel severely limits the ability of the laboratory to supply anything other than provisional results.

The laboratory generates the chemical/geochemical data necessary to maintain MRT's databases. A total of 324 samples, consisting of 154 water samples, 154 rocks and 16 minerals or products, were submitted for 8,595 individual determinations during the year.

A total of 395 samples were assayed for 7,201 individual determinations. The 395 samples analysed comprised 128 waters, 126 rocks and 141 minerals or products.

A major upgrade to the sample preparation laboratory to meet air quality standards and OH & S requirements was successfully completed early in the financial year. To maintain the smooth running of the upgraded sample preparation dust extraction unit, a new enclosed motor replaced the less protected and fused original motor. The new motor has resulted in further improvement due to increased suction which has given more control over the extraction system. This has made for a safer working environment with a higher level of efficiency and effectiveness.

The use of new and improved sample boxes for storage on pallets is being progressively implemented. This will allow for the rearrangement of stored samples and better accessibility.

Repair of the Leco Induction Furnace, involving replacement of capacitors and resistors at a cost of \$2,600, has avoided purchasing a replacement instrument valued at about \$45,000.

Careful operation and maintenance has kept the XRF unit and AA instruments operating in a stable condition

throughout the year. Further updating of the hardware and Windows-based software operating system has allowed data generated by the XRF to be better incorporated into the Tiger System databases. Apart from saving time on the operation of the unit and data processing, this will further limit the possibility of data transposition errors. The data from the XRF, Laboratory Register of Chemical Analyses and water analyses is now available in Excel format. This allows new data to be made freely accessible through the Tiger System.

Other activities

- ❑ Meetings of the Future Together Core Group and associated groups were attended during the year.
- ❑ Four staff members are on safety and workplace harassment committees.
- ❑ Branch members were involved in planning, presenting papers and leading excursions for the Australian Geological Convention held in Hobart in February 2004.
- ❑ A branch member is convener of a committee to prepare authority tables for the National Geodata Model, a working group established under the Government Geologists Information Policy Advisory Committee. A meeting of the group was held in Melbourne in June 2004.
- ❑ Three geologists attended the international *24-carat Gold* workshop held at Wrest Point in June 2004.
- ❑ Mineral exploration report and exploration performance assessments were carried out as needed, as was preparation of promotional leaflets for Exploration Release Areas. Particular attention was placed on monitoring performance on exploration licences.
- ❑ The petrologist presented a poster paper at the Australian Geological Convention in Adelaide in July 2003.
- ❑ Numerous meetings were held with industry and CODES-SRC, and presentations were given at the annual meeting of the Tasmanian Minerals Council on the three-dimensional geological model of Tasmania.
- ❑ Many requests for information on geology, mineral resources, minerals and related matters were received and dealt with promptly.
- ❑ Meetings of the Tasmanian Statistical Advisory Committee were attended during the year.
- ❑ Safety audits have been carried out in the laboratories and core library, including the safe storage of radioactive mineral samples. Work was done in updating safety manuals.
- ❑ A geologist attended the Ishihara granite symposium in Sydney in July 2003.
- ❑ A business review of the Exploration Release Area process was prepared.
- ❑ Training sessions on the 3-D model and FracSIS software were attended by geologists, and staff members undertook other self development training during the year.

Industrial Minerals and Land Management

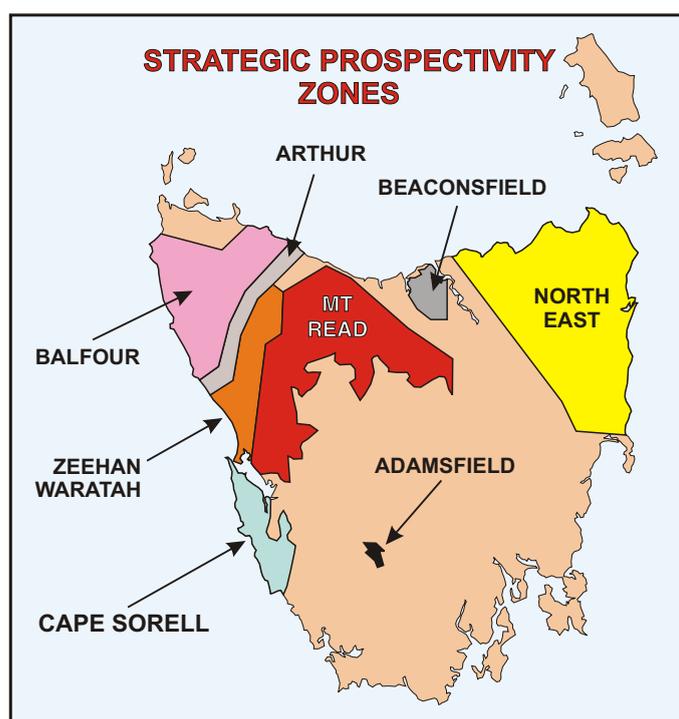
This branch is responsible for the investigation and promotion of industrial minerals, including coal and hydrocarbons; the management of mineral tenements, land access issues and environmental control of exploration activity; and the protection of mining heritage. It is also responsible for providing information for the management of groundwater resources and geohazards, especially land stability.

Strategic Prospectivity Zones

Strategic Prospectivity Zones (SPZ) cover 25 200 km² or 37% of Tasmania. The areas in each SPZ occupied by mining tenements at the end of June 2004 are shown below.

SPZ	Metallic		Non-metallic	
	Area (km ²)	Occupied (%)	Area (km ²)	Occupied (%)
Adamsfield	69.7	94.58	0.0	0.0
Arthur	566.1	51.10	310.3	28.01
Balfour	550.0	14.18	475.1	12.14
Beaconsfield	26.7	99.98	0.0	0.0
Cape Sorell	364.0	26.33	0.0	0.0
Mount Read	1909.8	26.63	107.6	1.50
North East	3393.0	34.95	320.5	3.30
Zeehan/Waratah	1000.7	54.56	137.3	7.49
	(7880.0)		(1350.8)	

In comparison to last year's occupancy for metallic minerals, the Mount Read SPZ has increased from 16.73% to 26.63%, the North East SPZ has increased from 31.27% to 34.95%, and the Zeehan /Waratah SPZ has increased from 22.53% to 54.56%.



Petroleum exploration and production

Seven offshore exploration permits and one onshore permit are currently held for oil and gas exploration, a production licence is held over the Yolla gas/condensate field in the Bass Basin, and a retention lease is held over a small acreage adjacent to the Yolla field. No hydrocarbons are produced in Tasmania or offshore waters, but gas production from the Yolla field is expected to commence in late September 2004, and from the Thylacine field in mid 2006.

The production licence over the Yolla field is held by a consortium headed by Origin Energy Resources Limited and AWE Petroleum Limited. The consortium was granted a renewal of the retention lease in October 2001, and a Production Licence was subsequently granted in April 2003. The BassGas project to develop the Yolla field involves construction of a production platform and an undersea pipeline to a processing plant onshore Victoria near Lang Lang. The project is expected to supply around 10 per cent of Victoria's natural gas needs for 15 years. MRT has been involved with discussions with the BassGas proponents, and Victorian and Commonwealth government agencies, regarding the necessary approvals for the project. Yolla-4, the first of two development wells, was spudded on 18 June 2004.

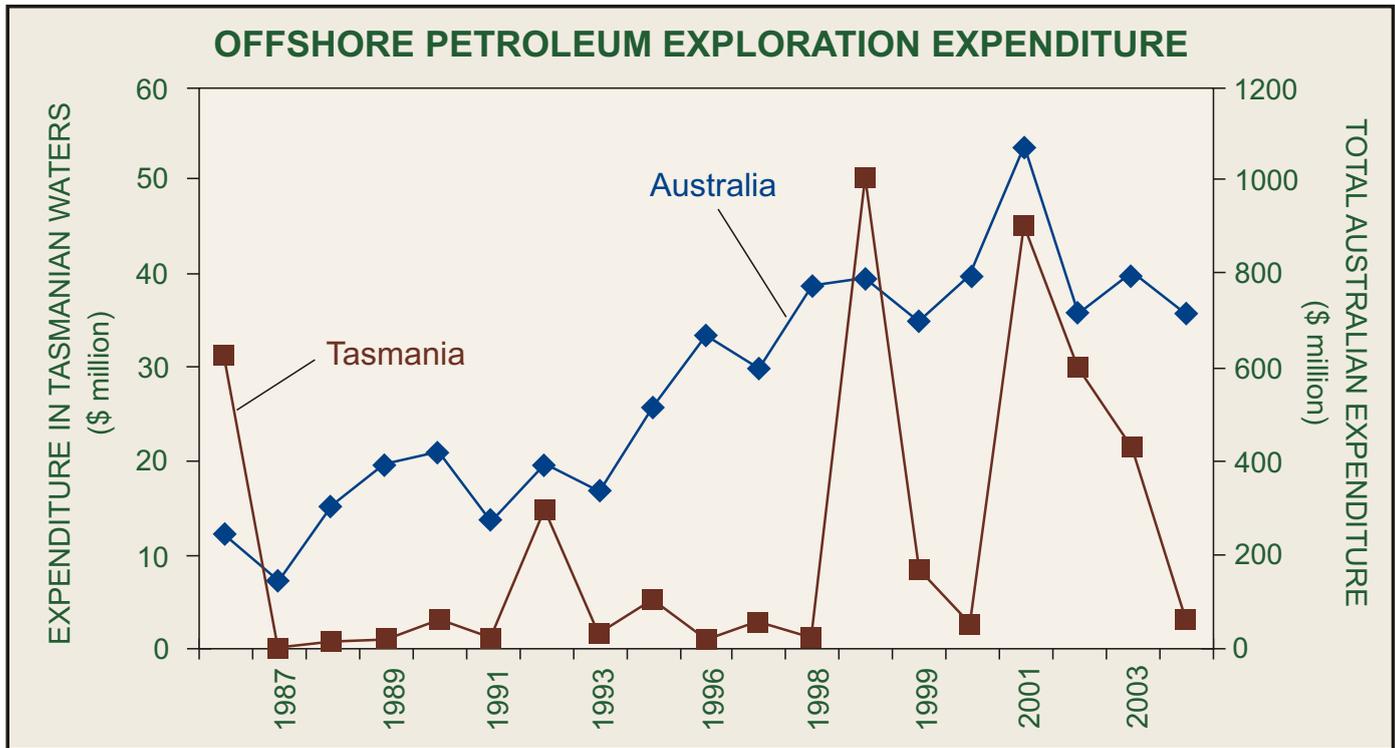
Woodside Energy Limited, on behalf of the Otway Gas consortium, has applied for a production licence for the development of the Thylacine gasfield, discovered in 2001 in the Otway Basin northwest of King Island. Thylacine will be developed concurrently with the neighbouring Geographe field, in Victorian waters, and the gas will be piped to a processing plant near Port Campbell in Victoria. Production is expected to commence in mid 2006 to supply the growing southeast Australian gas market.

Santos Limited completed a 1336 km 2D seismic survey west of King Island during November and December 2003.

Total Tasmanian offshore petroleum exploration expenditure for 2003/2004 was approximately \$3.278 million. The total offshore petroleum exploration expenditure for Australia in the period 1 April 2003 to 31 March 2004 was \$714 million. Petroleum development expenditure in Tasmanian waters in 2003/2004 was approximately \$247.6 million, mainly on the initial phases of the BassGas development.

Collaborative studies of the Bass and Sorell basins by MRT, Geoscience Australia and the Australian School of Petroleum (ASP) (formerly the National Centre for Petroleum Geology and Geophysics), funded by the Western Tasmanian Regional Minerals Program, were completed in late 2003. These studies, listed below, have provided a greatly improved understanding of the petroleum prospectivity of these basins.

- Geology and hydrocarbon prospectivity of the Bass and Durroon basins — Interpretation report;
- Bass and Durroon basins GIS Project;



- ❑ Review and compilation of open file micropalaeontology and palynology data from offshore Tasmania;
- ❑ Bass and Durroon basins, basic data compilation;
- ❑ An audit of petroleum exploration wells in the Bass Basin;
- ❑ Regional potential field interpretation report, Bass and Durroon basins;
- ❑ Western Tasmania regional seismic data, selected reprocessed lines from seismic surveys T69A and T70A.

A study on aspects of the petroleum prospectivity of the Sorell Basin, titled *West Tasmania study: hydrocarbon generation, migration, leakage and seepage*, was completed by ASP in March 2004. Palynological projects on the Bass Basin were undertaken by a consultant.

Sample collections related to offshore petroleum exploration, housed by MRT and including microfossils, drill core, cuttings and sidewall core, were reshelved and catalogued during the year. Seventy reports received during the year were indexed. Most open-file exploration reports can now be viewed and downloaded from the MRT website.

Eight offshore areas were gazetted for competitive work program bidding during 2004. Three of these areas in the Bass Basin were re-released areas with a closing date of 30 September 2004. The other areas comprised one in the Otway Basin closing on 30 September 2004, whilst three areas in the Bass Basin and one area in the Sorell Basin close for bids on 31 March 2005. Area T2004-5 (Sorell Basin) has been nominated as a Designated Frontier Area. This measure allows an immediate uplift of 150% on Petroleum Resource Rent Tax deductions for exploration expenditure incurred in the area. MRT staff have been actively involved in promotion of the offshore release areas, most importantly at major industry conferences. Staff

attended the APPEA conference in Canberra and the AAPG conference in Dallas (USA) to promote the offshore acreage.

Onshore, Great South Land Minerals Limited holds Special Exploration Licence 13/98 for petroleum, covering most of the Tasmania Basin. Renewal of this licence is under review.

Tasmanian Natural Gas Pipeline

Alinta DTH Pty Limited acquired the Tasmanian Natural Gas Pipeline (TNGP) from Duke Energy International in April 2004. The TNGP transports natural gas from Longford in Victoria to Bell Bay, Hobart and Port Latta via approximately 740 km of onshore and offshore pipeline. The gas is sourced from the Gippsland Basin in Bass Strait and made available, via the TNGP, to industrial and domestic markets in Tasmania.

The TNGP project expands the gas market in southeast Australia. A total of 20 permanent staff is employed to operate the pipeline, most of them based in Tasmania.

Industrial minerals

Tasmania Magnesite NL holds retention licences at Arthur River and Lyons River, and is actively seeking a buyer for the licences.

Mineral Holdings Australia Ltd continues to seek a joint venture partner for the development of dolomite and limestone resources in northwest Tasmania. The company wishes to develop an export industry based on chemical, industrial and agricultural carbonate products.

The proposal to develop heavy minerals beach sands at Naracoopa, on King Island, by Tasmanian Titanium Pty Ltd has received all necessary approvals from the King Island Council and the Tasmanian Government. It is the

company's intention to proceed with the development of a mine when funding is secured.

JJ MacDonald Pty Ltd was granted a retention licence over the Maydena/Pine Hill silica flour deposit. The company has made a considerable investment in defining the resource and testing the chemical and physical properties of the deposit. It is the company's intention to apply for a Mining Lease in 2004/2005.

Environmental management

The environmental monitoring of exploration programs continued with diligence and attention to detail. Regular field visits were made to ensure exploration work was being conducted in an environmentally responsible manner and that rehabilitation of past sites was successful.

Compliance auditing

In response to the Regional Forest Agreement and the RPDC Land Tenure Inquiry, MRT instigated a GIS-based project in 1998/1999 to develop a recording system of on-ground exploration activity. This project resulted in compliance auditing of the *Mineral Exploration Code of Practice* and in the auditing of the environmental effects of exploration in Tasmania.

As part of Project TIGER, Deloitte Touche Tohmatsu undertook a Business Process Review of the compliance auditing system in 2003. Following this review MRT has documented the functional requirements required to transfer this system into the corporate TIGER System. The conversion is dependent on resources or funding being made available during this financial year.

Forty-three exploration work programs were submitted to MRT for approval during the past year. Thirty-nine of these were approved, while four remain pending. Seventeen of these programs (including those pending) were within CAR Reserves and required comment from the Mineral Exploration Working Group. Members of the Mineral Exploration Working Group attended a number of on-site field inspections during the reporting period.

Table 1 summarises the types of activities approved, within a broad division of Tasmania's land tenure system.

A total of 1.54 hectares of actual on-ground disturbance was recorded through the year. Table 2 shows the breakdown of the disturbance for the different land tenures and activity types. Not all approved activities actually took place, and as High Quality Wilderness overlies other tenures, disturbance within this classification is accounted for in the figures for the other land tenures.

Of the 1.54 hectares of disturbance attributed to those exploration activities conducted during the reporting year, 1.19 hectares were rehabilitated, with the remainder to be rehabilitated through the life of the licence. It is a licence condition that all disturbances will be rehabilitated on expiry of the licence and prior to the return of the environmental bond.

In Table 3 the area that has been rehabilitated is shown for each activity and land tenure category. A percentage of the area rehabilitated against the disturbances in the above table is also shown. Approximately 77.3% of the area

Table 1: Activities approved

Activity	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill sites	17	16	42	9	13	0
Tracks (m)	1500	1500	1300	0	0	0
Costeans (m)	0	0	50	50	200	0
Helipads	2	4	2	0	0	0
Bulk samples	0	0	12	1	0	0

Table 2: Area of disturbance

Activity (ha)	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill sites	0.08	0.08	0.15	0	0.02	0
Tracks	0.30	0.30	0.62	0	0	0
Costeans	0	0	0.02	0.02	0.08	0
Helipads	0.06	0.12	0.06	0	0	0
Bulk samples	0	0	0.12	0.01	0	0
Total (ha)	0.44	0.50	0.97	0.03	0.10	0

Table 3: Area rehabilitated

Activity (ha)	Car Reserve System	High Quality Wilderness	State Forest	Crown Land	Private Property	HEC Land
Drill sites	0.08	0.08	0.03	0	0.02	0
Tracks	0.30	0.30	0.48	0	0	0
Costeans	0	0	0.02	0.02	0	0
Helipads	0.06	0.12	0.06	0	0	0
Bulk samples	0	0	0.12	0.01	0	0
Total area disturbed	0.44	0.50	0.70	0.03	0.02	0
Total area rehabilitated	0.44	0.50	0.97	0.03	0.10	0
Percentage of overall disturbance rehabilitated	100	100	72	100	20	0

Table 4: Disturbance and rehabilitation over three years

Year	Car Reserve System	State Forest	Crown Land	Private Property	HEC Land	Total
<i>Disturbance (ha)</i>						
2001/2002	0.42	0.32	0.05	0.16	0.05	1.00
2002/2003	0.07	2.30	0.25	0.02	0.02	2.66
2003/2004	0.44	0.97	0.03	0.10	0	1.54
Total disturbance	0.93	3.59	0.33	0.28	0.07	5.20
<i>Rehabilitated (ha)</i>						
2001/2002	0.21	0.32	0.05	0.16	0.05	0.79
2002/2003	0.07	2.30	0.25	0.02	0.02	2.66
2003/2004	0.44	0.70	0.03	0.02	0	1.19
Total rehabilitated	0.72	3.32	0.33	0.20	0.07	4.64
Percentage of overall disturbance rehabilitated						
	77.4	92.5	100	71.4	100	89.2

disturbed in the reporting period, for all land categories, has been rehabilitated.

Because of the very low environmental impact of gridding this activity does not feature in terms of disturbance attributed to exploration activity, although it does constitute a portion of the proposals and as such is still

noted. A total of 58.2 line kilometres of gridding was undertaken in the year, with 51.2 km in CAR Reserve System areas, 5 km on Crown Land, and 2 km on private property. Of this, 27.5 km of gridding was in High Quality Wilderness areas.

Table 4 presents running totals over the last three years of the area of disturbance and the area rehabilitated.

Approximately 90% of overall disturbance has been rehabilitated. Disturbances are no longer counted as such if:

- no further rehabilitation work is required of the explorer;
- the area is taken up as a Mining Lease.

As High Quality Wilderness is an overlying layer on the above land tenures it is treated separately (Table 5).

Table 5: Disturbance and rehabilitation, High Quality Wilderness areas

Year	Disturbance (ha)	Rehabilitated (ha)	Percentage of overall disturbance rehabilitated
2001/2002	0	0	NA
2002/2003	0	0	NA
2003/2004	0.50	0.50	100
Total	0.50	0.50	100

Codes of practice

The fourth edition of the *Mineral Exploration Code of Practice* is a code under the *Mineral Resources Development Act 1995*. As specified in the Resource Planning and Development Commission 'Inquiry into areas to be reserved under the Tasmania–Commonwealth Regional Forest Agreement', this code will be reviewed at regular intervals and issued for public comment. This review will follow the release of the *Reserve Management Code of Practice*, providing adequate resources are made available, to ensure that both codes are consistent. A project proposal has been submitted to fund a fifth edition of the *Mineral Exploration Code of Practice* during the coming financial year.

The second edition of the *Quarry Code of Practice* was issued in September 2000 and has been gazetted as a code under the *Mineral Resources Development Act 1995*.

Mines Inspection

Several mines continued to suffer difficult economic conditions during 2003 but recovery was apparent during 2004. Notably Pasminco emerged from administration as Zinifex Limited, while the Renison Bell mine was acquired by Bluestone Nominees Pty Ltd, which is to redevelop the mine.

Two new operations commenced during the year. Allegiance Metals Pty Ltd began construction of a decline at Avebury near Zeehan, and is preparing a development proposal for production of nickel to commence in 2005. Cornwall Coal NL commenced production at Kimbolton near Hamilton, initially supplying coal to the Norske Skog paper mill at Boyer. Australian Bulk Minerals at Savage

River continued to investigate the potential for underground development of the North Pit.

Leasing

Surveys of mining leases using GPS technology are routinely carried out during inspections. The results are used to provide data to populate a geographic information system which was developed in 2003. As data accumulates it will provide a comprehensive picture of the disturbance caused by mining and quarrying, and the effects of subsequent rehabilitation. Site plans can also be generated and supplied to operators to form the basis of mining plans for development applications. Discrepancies between lease position and the actual pit location can be recognised and lease adjustments recommended.

Instructions were issued to stop work at an unregulated sand pit adjacent to a farm dam at South Arm and two gravel pits at Dorset. Liaison with councils resulted in the closure and rehabilitation of an unregulated sand pit on the foreshore near Marrawah, and a gravel pit on King Island. A dispute between neighbours affected by road traffic from a pit near Sheffield exposed problems with the regulation of Level 1 permits when production rates increase.

Tailings dams

Provisions for the safety of tailings dams have been resolved. Amendments to the *Water Management Act 1999* were passed by Parliament in 2003 and the regulations promulgated in 2004. Approval for larger dams is required under the *Environmental Management and Pollution Control Act 1994*; these must incorporate design, safety and operational requirements under the Water Management Act. MRT is involved in dam operations through rehabilitation and mining lease provisions.

Planning issues

Submissions were drafted for planning schemes which were under review.

- At Clarence submissions focussed on protection of existing resources at the Flagstaff Gully quarry and access to known sand resources at Llanherne.
- At West Tamar, a submission focussed on excessively onerous information requirements for extractive industry approval applications.

An objection was made to a proposed subdivision close to the Flagstaff Gully quarry which resulted in modifications to the development proposal.

MRT has been providing the mineral prospectivity map series to council planners under exchange of information provisions of the partnership agreements.

Rehabilitation works

Mine rehabilitation was carried out by MRT at abandoned alluvial tin mines near St Helens and Balfour, and at gravel pits near Sheffield. Shaft protection programs were carried out at Oakleigh Creek, Round Mount and Mt Bischoff, and weed control was undertaken at the Queensbury mine. Work was funded by the Rehabilitation of Abandoned Mining Lands Trust Fund. A detailed report is provided later in this Review.

The site of the historic Mt Bischoff mine is degraded and acid drainage emissions affect some twenty kilometres of the Arthur River downstream. A Commonwealth grant from RiverWorks Tasmania, administered by MRT, was used to investigate the environmental impacts of the Bischoff workings, and to recommend and carry out an initial phase of drainage control. Wet conditions caused the drain construction to be interrupted in the winter months of 2003, with work being completed during 2004.

Savage River Rehabilitation Program (SRRP)

The Savage River Rehabilitation Program (SRRP) is carried out in partnership by the Department of Primary Industries, Water and Environment and Australian Bulk Minerals. The strategic plan was revised to provide for increased treatment and to reduced reliance on mitigation projects. The major works underway are the continued rehabilitation of 'B' Dump, which is being redeveloped to minimise acid generation. Planning for an alkalinity addition trial for treatment of waste rock seepage water is proceeding.

Archaeological surveys

The Silver King mine site was surveyed for the Zeehan Landcare group. Reconnaissance surveys of the Oonah Smelter, South King and Zeehan Bell workings were carried out. Possible impacts on heritage features by the proposed rehabilitation works at Balfour were assessed.

Registry Section

The Registry Section maintains a number of mining tenement registers in hard copy and electronic format. The section provides advice to officers within MRT, enquirers from other agencies, the mining industry, the legal profession and the general public on a wide range of matters associated with mining tenements and legislation.

The processing of applications for mining tenements and issue of tenement documentation continues to provide the majority of work for the section's officers.

Close liaison is maintained with professional geological officers of MRT, particularly in relation to maintenance of the TASXPLORE database, monitoring of exploration expenditure, circulation of company reports, and preparation and circulation of the *TasXplorer* news sheet.

The section liaises with a number of other agencies in regard to tenement applications and provides information to field staff who monitor on-ground activity on mining tenements.

Requesting and collation of production and expenditure statistics is an important activity carried out by the section. These statistics provide the basic data for collection of royalties and assessment of exploration levels.

As a result of forced budget savings it was necessary to restructure areas of the Registry Section. Changes have been foreshadowed in legislation to meet increases in processing times following a decrease in staff levels.

Exploration Release Areas are offered to potential explorers by way of the *TasXplorer* news sheet, which is circulated

widely within the Australian mining community. The news sheet is sent to 332 clients of MRT by facsimile (87), e-mail (63) and post (182), and is also available on the MRT website. Twenty-two ERA's were offered during the period resulting in seven exploration licences being applied for over an area of 232 km².

Officers of the section play a key role in maintenance of the TASXPLORE and REGIS modules within the TIGER System.

Mining legislation

The *Mineral Resources Development Act 1995*, which came into force on 1 July 1996, is the principal legislation relating to the management and regulation of mining tenements in Tasmania.

Mineral Resources Tasmania provides information through Service Tasmania outlets, and forms approved under the *Mineral Resources Development Act 1995* are available via MRT's webpage or on disc.

Mining Tribunal

Under the *Mineral Resources Development Act 1995*, a Mining Tribunal, consisting of a magistrate, has coverage of all Tasmania.

The Act places an obligation on the Director of Mines to attempt to resolve disputes before there is a formal hearing before the tribunal. In effect this usually consists of an informal meeting, arranged by the Registrar of Mines, between the parties.

Experience to date suggests that the dispute resolution process required by the Act adequately covers most situations that would otherwise require formal determination.

Matters referred to the Mining Tribunal during the year were:

74178 *ZZ Exploration Pty Ltd v McDermott Mining Pty Ltd* — ELA 17/2003

Appeal against awarding of Exploration Release Area. Appeal withdrawn.

74190 *S M Coppe, D & K Lake and S Rawnsley v Lefroy Resources Ltd* — ELA 28/2003

Objection lodged by landowners. No resolution to date.

74195 *G Lear v Sapphire Trading Ltd* — 167M/1991, EL35/2001 and EL2/2002

Dispute re interest in mining tenements. Claim withdrawn

74199 *H M Murphy v Auzex Resources Pty Ltd* — ELA 41/2003

Objections lodged by owner of land found to be outside application area. Objection withdrawn.

74201 *G J Cresswell Transport Pty Ltd v M L & R D Graham* — 1474P/M

Request for determination of compensation. No resolution to date.

74206 *Hydro-Electric Corporation and Tarkine National Coalition Inc. v Auzex Resources Pty Ltd* — ELA 19/2004

Objection lodged by holder of Crown Land Lease and conservation action group. No resolution to date.

74207 *Hydro-Electric Corporation v Providence Gold and Minerals Pty Ltd* — ELA 46/2003

Objection lodged by holder of Crown Land Lease. No resolution to date.

74208 *Tarkine National Coalition Inc. v Auzex Resources Pty Ltd* — ELA 4/2004

Objection lodged to highlight natural values of areas within application area. No resolution to date.

74209 *Tarkine National Coalition Inc. v Auzex Resources Pty Ltd* — ELA 3/2004

Objection lodged to highlight natural values of areas within application area. No resolution to date.

74210 *Tarkine National Coalition Inc. v Index Group of Companies Pty Ltd* — ELA 33/2004

Objection lodged to highlight natural values of areas within application area. No resolution to date.

74211 *Tarkine National Coalition Inc. v Discovery Nickel Ltd* — ELA 18/2004

Objection lodged to highlight natural values of areas within application area. No resolution to date.

74212 *M J Cocker v J J Stewart and P W Askins* — ELA 29/2004

Objection lodged to highlight natural values of areas within application area. No resolution to date.

74213 *J M Hayward v Greatland Pty Ltd* — ELA 31/2004

Objection lodged by land owner. No resolution to date.

Four matters were resolved by mediation during the year and formal hearings were conducted by the Mining Tribunal for five matters.

Lease Applications, 2003/2004

Total number of all types of exploration rights held as at 30 June 2004

<i>Mining Tenement</i>	<i>Number</i>	<i>Area</i>
Exploration Licences —		
Category 1 (Metallic minerals)	115	5 669 km ²
Category 2 (Fuel minerals)	2	75 km ²
Category 3 (Construction minerals)	7	145 km ²
Category 4 (Oil — onshore)	2	60 826 km ²
Category 5 (Industrial minerals)	15	2 502 km ²
Retention Licences —		
Category 1 (Metallic minerals)	14	118 km ²
Category 2 (Fuel minerals)	5	170 km ²
Category 3 (Construction minerals)	5	23 km ²
Category 5 (Industrial minerals)	8	30 km ²
Prospectors Licences issued	99	Not applicable
Permits to explore for petroleum under the Commonwealth <i>Petroleum</i> (<i>Submerged Lands</i>) <i>Act 1967</i>	7	363 Blocks
Retention Licence under the CPSLA 1967	1	5 Blocks
Pipeline licences held under the CPSLA 1967	2	
Pipeline licences held under the Tasmanian <i>Petroleum (Submerged Lands) Act 1982</i>	1	
Production licences held under the Tasmanian <i>Petroleum (Submerged Lands) Act 1982</i>	1	

Leases applied for

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	1	597
Dolomite	1	100
Easement	2	4
Gold	1	18
Gravel	9	100
Gravel and clay	1	5
Magnesite	1	647
Peat	1	9
Sand	4	61
Sand and gravel	3	249
Sand and stone	1	25
Silica	1	1
Specimens	2	38
Stone	4	65
Stone and gravel	3	17
Tin	2	126
Storage lease	1	107
Total	38	2169

Leases granted

<i>Product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	2	60
All minerals and stone	1	11
Gold	3	532
Gravel	6	85
Nickel	1	400
Sand	2	11
Sand and gravel	1	74
Specimens	2	2
Stone	7	47
Stone and gravel	1	10
Storage lease	1	107
Tin	1	66
Total	28	1405

Total number of leases in force at 30 June 2004

<i>Principal product</i>	<i>Number</i>	<i>Area (ha)</i>
All minerals	30	19 136
All minerals and stone	6	5 709
Clay	8	92
Coal	3	6 314
Coal and stone	1	175
Copper	1	5
Dolerite	1	40
Dolomite	3	238
Easements	18	285
Gold	16	1 535
Granite	4	50
Gravel	168	3 133
Gravel and clay	2	34
Lime sand	4	219
Limestone	12	1 276
Magnesite	2	1 167
Magnetite	1	55
Nickel	1	400
Ochre	1	15
Peat	1	9
Quartzite	1	191
Sand	53	2 181
Sand and gravel	24	1 551
Sand and stone	10	322
Sandstone	5	39
Shale	3	35
Silica	5	437
Silica sand	1	20
Silica, sand and stone	1	50
Slate	3	165
Specimens	15	119
Stone	227	5 432
Stone and gravel	24	483
Storage lease	1	107
Tin	8	915
Umber	1	6
Total	665	51 940

Engineering Geology and Groundwater Section

This section provides geoscientific information for the management of groundwater resources, waste disposal sites and geohazards, especially land stability. By ensuring relevant geoscientific data are available to the public and private sectors, better land-use decisions can be made.

The section was involved in a number of projects during the year. Enquiries from local government, other agencies and the general public for information on both engineering geology and groundwater continued as a prime function.

Engineering Geology

Land stability is a major issue in Tasmania and the current property boom is placing additional calls for information on areas throughout the State. Much of the routine work carried out on land stability matters falls into the following three main activities.

Geohazards database

The new landslide database (constructed in the previous year) was designed to store much of the data relating to land stability in Tasmania and underpins the project work that is being done by MRT. Considerable effort went into housekeeping tasks over the year by a working group. This included documenting the data dictionary and developing business rules which will be incorporated into a user manual to be developed in the coming year. Minor fixes and changes to the database are being documented. Data is being routinely entered into the database and retrieved via querying tools.

Monitored landslide program

A report on the Beauty Point landslide is currently being prepared. This report is the first in a series on monitored landslides that occur in northern Tasmania. The emphasis of these reports is to collate all available information into a single document that can be passed onto the key stakeholders for risk assessment and management purposes.

Landslide hazard mapping program

Work is well underway on the first of a new landslide hazard map series which aims to produce maps of the major urban areas. These maps are based on a methodology that has been developed over the last three years for MRT.

The first maps for completion cover the area of the Hobart Municipality and will include rockfall, debris flow and deep-seated landslide hazards. MRT is working with the Hobart City Council in partnership to ensure the maps include knowledge of past landslips and other geological information that is held in council files. Such knowledge underpins the hazard map methodology and ensures a robust depiction of the potential hazards for the area.

A seminar outlining the project, and inviting feedback, was held in Launceston and Hobart. Feedback received was encouraging and has helped shape the final output.

Groundwater

Groundwater is a precious resource in Tasmania that contributes considerably to the prosperity of the State by underpinning various forms of primary industry. As demand for water increases, careful management is required to ensure long-term sustainable use and to prevent contamination. Inappropriate use of groundwater is leading to salinity problems on farmland in some parts of Tasmania, while groundwater contamination associated with various forms of land use is a continuing problem.

State Groundwater Coordinating Group

While the legislative responsibility for groundwater management belongs to the Department of Primary Industries, Water and Environment (DPIWE), much of the skill base and data relating to groundwater reside in Mineral Resources Tasmania. The State Groundwater Coordinating Group meets regularly to ensure personnel in both departments are informed of all activities and that a truly co-ordinated approach to water management can be achieved.

An MRT hydrogeologist represents Tasmania on the National Groundwater Committee (NGC). During the last year, the NGC has organised two major workshops, one on Groundwater Dependent Ecosystems (GDE) and the other on future research needs for integrated surface and groundwater management. As a result of this work, two papers; *Report on the national workshop on the groundwater dependent ecosystems* and *Knowledge gaps for groundwater reforms* were published. MRT was involved with DPIWE in undertaking a preliminary desktop study of GDE in Tasmania. A successful groundwater school was organised in Hobart in November.

Four Commonwealth Government-funded salinity projects and one wastewater reuse project commenced during the year. MRT provided supervision, technical advice and data to these important initiatives.

Groundwater monitoring

MRT manages a monitoring network of 34 boreholes throughout Tasmania, with routine sampling every six months. An ongoing process of upgrading the network continued with the deployment of new data recorders. The information collected provides baseline data to enable long-term trends in water quality and quantity to be analysed. A review of the network was completed during the year to allow informed management decisions to be made about the network. The report includes a summary of the results of fourteen years of monitoring activity, including trends in water levels and chemistry.

Groundwater maps

Work on the 1:500 000 scale map of Tasmanian groundwater flow systems was completed in conjunction with DPIWE. The map and accompanying report provide information critical for the future management of the dryland salinity process in Tasmania under the National Action Plan program. Maps at 1:250 000 and 1:100 000 scale were prepared to draft standard summarising the

hydrogeology of Tasmania. These maps, when published, will represent the first synthesis of groundwater knowledge of the area and are, in part, being produced for local councils under the partnership agreements.

Groundwater database

The groundwater database, when fully functional, will be a major asset for water management in Tasmania. Unfortunately there is still a considerable amount of work that is required to sort out issues associated with migration and design. Queries of the database are being made routinely to support project work being undertaken by MRT, and some data can be accessed via the internet. This is helping to provide timely information to members of the public.

Driller's reports

Drillers are required to submit reports of groundwater investigations on a form that was recently redesigned for this purpose. The completed forms are checked and entered into the database by MRT staff.

Groundwater quality

Groundwater quality protection issues associated with a number of wastewater reuse schemes continued to form an important element of the section's activities. This included advice on the potential affects on groundwater by this method of irrigation. The section also provides advice on groundwater issues relating to mining tenements.

Information Systems and Geophysics

The main activities of the Information Systems and Geophysics Branch in the 2003/2004 year were:

- ❑ Maintenance and development of the TIGER (Tasmanian Information on Geoscience and Exploration Resources) System;
- ❑ Maintenance and development of RIMS (Road Information Management System);
- ❑ Undertaking a Business Process Review of MRT's activities; and
- ❑ IT related training of MRT staff.

The branch also provided geophysical services and advice to MRT and our clients, and computer and network support for MRT.

The branch is structured to reflect the functions needed to achieve the outcomes required by MRT and has Project, Operations and Geophysics sections. At 30 June there was one fixed-term staff member in the Project Section undertaking the MRT Business Process Definition Project and five permanent systems support staff in the Operations Section. The systems support staff are deployed within the functional areas of PC and network operations or database and TIGER System support. One other permanent staff member supports the Road Information Management System (RIMS). The branch manager is also responsible for geophysical activities.

Major branch achievements during the year included:

- ❑ completion of the geophysical aspects of the Western Tasmanian Regional Minerals Program;
- ❑ a successful transition from project-based development of the TIGER System;
- ❑ migration of datasets to the TIGER System;
- ❑ release of two new versions of the RIMS software;
- ❑ building an increased skills-base for information systems staff;
- ❑ a continued high level of use of the MRT website;
- ❑ implementing updated project management guidelines within MRT;

- ❑ one-on-one training for project proponents and working group coordinators;
- ❑ completing a process review for a number of mineral tenement related activities; and
- ❑ establishing an MRT Information Management Group.

Data capture

Capture of metadata summarising technical documents relating to exploration continued throughout the year, with 119 new summaries entered and 222 summaries updated. In addition to internet searching of the summaries of open-file technical documents held by MRT, all open-file documents relating to onshore or offshore exploration and open-file MRT publications can be viewed or downloaded in full over the internet.

All mineral exploration reports are now required to be in the national standard format for digital reporting. Compliance with the report format at initial lodgement is now in excess of 95 per cent. This has reduced the time between receipt of reports and completion of the conversion to a web-viewable format. Consultation with and assistance to stakeholders to ensure close compliance with the data formats detailed in the national guidelines has continued and has contributed to the high-level of conformance with the guidelines.

TIGER System

Following completion of Project TIGER on 30 June 2003 the TIGER System, which provides a single storage environment for MRT's corporate data, entered a phase of maintenance and enhancement supported entirely by MRT resources. The MRT website enables access to this corporate data and associated metadata from anywhere in the world with internet access.

MRT staff enter, maintain and search corporate data relating to all aspects of MRT's activities including tenements, exploration reports, MRT publications, groundwater, drilling, geohazards, samples and observations, mineral deposits and geophysics using a

number of browser-based thin client applications accessed via the MRT intranet. The data are delivered to clients through the MRT website using customised textual and spatial searches. A number of sets of basic data can be downloaded from the website.

An Information Management Group, that includes both management and technical staff, oversees the ongoing operation of the Information Management System and was established as part of the transition from development status to operational status. The group receives information from a number of working groups that provide information on issues to be resolved and define new functions for the TIGER System, as well as allocating resources in accordance with departmental and divisional priorities. Change request and fail and fix methodologies have been introduced to assist the working groups with continuing the progressive migration of legacy data into the TIGER System, and in developing the specifications for further development of the system.

Data migration into the TIGER System has progressed steadily throughout the year, and tools for final verification and user acceptance of migrated data have been developed using Oracle Discoverer. At the end of the year migration activity was centred on the samples, geochemistry and observations module, where all rock chemistry data had been migrated and migration of the rock and mineral catalogues (TASROK) was in progress. Upgrades to the data model and thin client applications have been required during the migration to accommodate new business rules and additional data items. New tools are being investigated for developing the browser-based forms and reports used by the thin-client applications.

Project TIGER formally closed when the Project Steering Committee accepted the project manager's Project Closure Report at the final steering committee meeting on 2 October 2003. Work has continued on developing a new Short Form Data Licence Agreement, which has now been approved by the LICC, and on developing a Data Share Agreement with The LIST.

IT summary

In accordance with government guidelines, MRT replaces desktop PCs every three years and transfers the original PCs to the Schools Program. New PCs are purchased with the current Microsoft enterprise operating system and as a consequence the introduction of Windows XP has commenced following extensive testing of software compatibility. The progressive migration of desktop workstations to Office XP has now been completed.

There are four network PC servers, three of which run Windows 2000. The main PC network server has been upgraded and is now running Netware 6.1 with approximately 136 gigabytes of on-line storage. Windows 2000 servers provide anti-virus, email, intranet and image delivery services to MRT staff. Files on the corporate Unix systems are accessed from PCs using Samba software. Automatic gathering of software inventories from desktop PCs and licence metering are part of the IT infrastructure.

Two Unix systems provide corporate information technology services to MRT staff. In addition there is a

Unix server dedicated to development and testing for the TIGER System, a Unix web-server for the MRT intranet, and a small Unix server used for Samba and for interim storage and backup of scanned documents. A further two Unix servers host the MRT website. The communications link to the Rosny Park building was upgraded in May 2003 and the MRT website was relocated to Rosny Park to simplify maintenance and up-loading of data to the website servers.

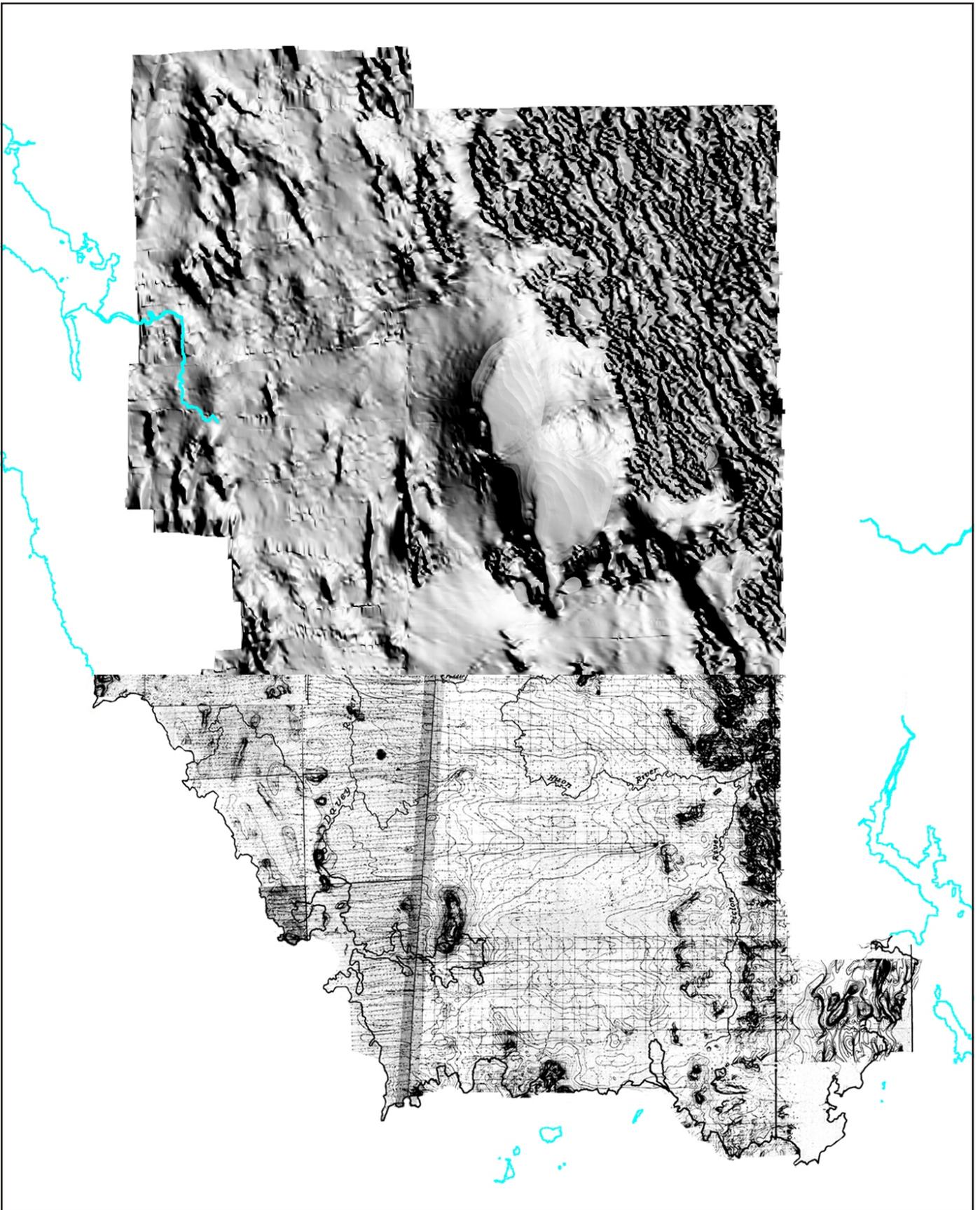
In addition to direct support of the TIGER System, the operational group has provided support for many divisional information-related activities.

- ❑ MRT is now part of a DIER-wide Microsoft Exchange mail system that allows shared calendars across the divisions of DIER.
- ❑ A review of MRT's spatial data storage requirements is in progress to determine the requirements for use of spatial data and hence the options for storage and access. Extensive consultation with users has enabled much infrequently accessed data to be archived to CD and removed from network servers without inconvenience to users.
- ❑ Desktop workstations have been installed in the MRT library to provide public access to on-line MRT information resources and to the 3D geological model of Tasmania.
- ❑ Information systems infrastructure has been improved with the installation of new switches and hubs, the installation of extra UPS capacity, and air conditioning and upgraded computer room security.

Extensive one-on-one and group training has been provided to users in the use of the thin client applications in the TIGER System, in spatial indexing of exploration activity, in use of Microsoft Outlook and the MRT website. Members of staff from all branches of MRT have received external training in the use of Oracle Discoverer to query the corporate database. Information Systems staff have received external training or undertaken self-training courses in development of applications using Oracle software, and in the underlying infrastructure of the TIGER System.

The development and maintenance environments for both RIMS and the TIGER System are co-located within MRT and this has produced overall benefits for DIER. A resource of one full-time equivalent staff member was dedicated to RIMS during the year for application maintenance and development. Two major software releases and one minor release were completed. External contractors migrated the Forward Program Reports to Oracle Reports. As part of the plan to move from a custom-written reporting tool, a number of other reports were also converted to Oracle Reports. Preparations are being made for the use of spatial data in RIMS and for the use of Oracle Discoverer to access the RIMS database. A second RIMS developer will commence in August 2004.

The MRT website continued to be well used, with an average monthly download volume of 15 GB and a peak monthly download volume of 57 GB. The MRT website provides a high-speed access point for clients to access the open-file data held in the MRT corporate information



Contour and flight-path data from analogue aeromagnetic surveys undertaken between 1957 and 1966 (bottom half) have been digitised and processed using modern digital processing techniques. The surveys were flown with 400 metre line spacing and a nominal terrain clearance of 150 metres, both of which are significantly better than any of the more modern surveys over the same area. The reprocessed data (top half) show structure within the dolerite-covered northeast corner of the survey area and enhance subtle features previously not visible or not clearly seen in the more modern data.

management system. Mapping of the structure of the website is currently being undertaken in preparation for migration to a new version of the Oracle Portal software. Links to the BizTas website provide details of Tasmanian-based service providers that can provide services to MRT clients. Open-file data within the Oracle database is replicated on a daily basis from the MRT corporate information management system to the website. The website also offers Web Map Service/Web Feature Service for a restricted number of datasets. Larger datasets stored on the file system are not suited to routine replication and several manually triggered data updates have been undertaken. Research into possible options for automated replication of data stored in the file system is continuing. In excess of four terabytes of network attached storage is used to accommodate these large data volumes.

Western Tasmanian Regional Minerals Program

A reference group with an independent chairman and members drawn from the Tasmanian Minerals Council, the Department of Industry, Science and Resources and MRT developed a series of projects to implement the geoscience infrastructure recommendations of the Final Regional Development Plan of the Western Tasmanian Regional Minerals Program. The Information Systems and Geophysics Branch was responsible for the acquisition of aeromagnetic, radiometric and airborne electromagnetic data over parts of King Island and western and northwestern Tasmania, and for the scanning and implementation of internet viewing and downloading of the technical documents held by MRT. The previously released data from aeromagnetic surveys over King Island and western and northwestern Tasmania, and electromagnetic surveys over selected areas of western and northwestern Tasmania, have been well received by the mineral exploration industry.

A new project proposal for the capture of analogue aeromagnetic data from an area adjacent to that flown under the Western Tasmanian Regional Minerals Program was accepted by the Commonwealth and completed this year. Contour and flight-path data from aeromagnetic surveys undertaken between 1957 and 1966 were digitised and processed using modern digital processing techniques. The surveys were flown with 400 metre line spacing and a nominal terrain clearance of 150 metres, both of which are significantly better than any of the more modern surveys over the same area. The reprocessed data show structure within the dolerite-covered northeast corner of the survey

area and enhance subtle features previously not visible or not clearly seen in the more modern data.

Geophysics

The MRT website has indexes to gravity base stations, to airborne geophysical surveys for which digital data are held, and to gravity stations available for clients. Where applicable the basic digital data can also be downloaded. New open-file data has been added to the website as it is received. Survey control point information can be easily retrieved from The LIST after carrying out a map-based search on the MRT website.

Preparation has continued for conversion of geophysical data from AGD66 to GDA94. Specialised software has been incorporated within some of MRT's existing FORTRAN code to assist in the conversion process.

Business Process Definition Project

A project to document and refine MRT's business processes in order to take advantage of the new corporate information management system (TIGER), and to reduce the risks associated with dependence on individuals, commenced at the start of the year. The major deliverables will include documentation of revised business processes that support MRT's core business, better integration of related activities, documentation of the processes used to carry out this project, and training and templates for MRT staff to maintain documentation of business processes for MRT operational and project-based work.

An initial review showed that many activities throughout MRT are related to mineral tenements and the project commenced with a review of all tenement-related activities. A process review has been completed for tenement applications, bonds, renewals, relinquishments/surrenders/expiries, royalty collection and reconciliation, rent demands, annual review reporting and dealings. The Exploration Release Area process has been documented and a number of changes flagged for inclusion in the REGIS system and tenement workflows.

Current project activities include documenting tenement compliance (new applications, bonds, tenement inspections, tenement renewals, end of tenement compliance, tenement performance compliance and tracking), developing functional requirements for TEAMS II, and describing the existing mining lease inspection system.

Data Management

The role of the Data Management Branch includes:

- ❑ geoscientific data management;
- ❑ tenement management services;
- ❑ management of the Geographic Information System (GIS);
- ❑ management of the Computer-Aided Drafting (CAD) system; and
- ❑ provision of support drafting services.

During 2003/2004 the capture of 1:25 000 scale digital geological data continued. Much of this work was done as part of the Western Tasmanian Regional Minerals Program (WTRMP) and resulted in the completion of forty whole map areas and four part map areas throughout Tasmania:

- ❑ twenty-one 1:25 000 scale digital geological maps in northwestern Tasmania (Ahrberg, Bellinger, Burnie, Castra, Devonport, Hardwicke, West Heemskirk, Kindred, Latrobe, Liena, Loyetea, Mole Creek, Montagu, Railton, Riana, Sheffield, Stowport, Studland, Tewkesbury, Ulverstone, Wynyard);
- ❑ eleven complete 1:25 000 scale digital geological maps in southwestern Tasmania (Endeavour, Hibbs, Kelly, Loddon, Mainwaring, Mallanna, Montgomery, Professor, Strahan, Teepookana, Veridian);
- ❑ eight complete and four part 1:25 000 scale digital geological maps in eastern Tasmania (Blackmans Bay, Bridgenorth, Cluan, Collinsvale, Deloraine, Liffey, Longley, Montana, New Norfolk, Parkham, Quamby Bluff, Westbury).

Work on the 'seamless' coverage of 1:25 000 scale digital geology of Tasmania continues, with maintenance being carried out on a regular basis. Maintenance of the 1:250 000 scale digital geology of Tasmania was also carried out on a regular basis.

As a result of remodelling of the Devonian–Carboniferous granitoids as part of the WTRMP, a new 1:500 000 scale map showing the major granitoids of Tasmania was produced. A digital 1:500 000 scale mining infrastructure map was also completed. Hardcopy outputs of other digital data, at 1:500 000 scale, showing geology with 3D topographic relief, construction material deposit locations and mineral deposit locations were also commenced.

Twenty-one draft 1:100 000 scale groundwater prospectivity maps were completed as part of the 1:100 000 scale Municipal Planning Series of maps. These maps are designed to provide geoscientific and tenement information to municipal councils/land use planners in an easily understood format. These maps are currently subject to review.

In association with the 1:100 000 scale Municipal Planning Series maps, eight draft digital 1:250 000 scale maps covering the groundwater prospectivity of Tasmania were produced. These maps are also subject to review.

A digital 1:500 000 scale map of groundwater flow systems in Tasmania was completed in partnership with the Department of Primary Industries, Water and Environment.

Four landslide hazard classification maps were produced as part of a regional landslide hazard assessment of the greater Hobart area. These maps are now subject to review. An upgrade of the existing landslide advisory zone maps of the Launceston area was undertaken, with fourteen new maps produced. The six 1:25 000 scale Northwest Tasmania Land Stability maps were also upgraded.

CAD continues to be used as a support tool for many projects, with 35 maps and plans and 226 tenement maps and diagrams being produced throughout the year.

Tenement administration work included:

- ❑ forty-eight new exploration applications processed and entered into the tenement information system;
- ❑ twenty-four exploration tender area plans produced and entered into the tenement information system;
- ❑ thirty-eight new mining leases processed and entered into the tenement information system; and
- ❑ data on thirty-eight proposed 'on ground' work programs for exploration licences was entered into the MRT information system for monitoring this type of exploration activity.

A total of 1200 hardcopy output products of digital geology/tenement data was produced on demand using the division's inkjet plotters, with 119 sets of digital geological data being produced for clients.

Finance, Royalty and Administration Branch

This branch provides the corporate support function for Mineral Resources Tasmania, and is responsible for:

- ❑ efficient royalty and fee collections and assessment so that the system is properly managed and accounted for to the satisfaction of the Auditor-General;
- ❑ timely provision of a financial, accounting and administrative service to the division in conjunction with departmental corporate services;
- ❑ production of publications relating to the interpretation and recording of Tasmania's geoscientific nature, geohazards and mineral wealth, in both electronic and hard-copy form, including geological reports, promotional documents, newsletters, materials for displays, Exploration Release Area flyers, and other reports and leaflets as required;
- ❑ maintenance of the static content of the MRT website;
- ❑ ensuring that all corporate information is kept in an orderly manner and is readily retrievable; and
- ❑ maintenance of the MRT library collection, including the development and delivery of library and information services to MRT staff and members of the public.

Publications

Major publications produced during the year included:

- ❑ The Mineral Resources Tasmania *Annual Review* for the year 2002/2003.
- ❑ *Mineral exploration opportunities in Tasmania. A summary of opportunities for mineral exploration and mineral resource development in Tasmania* — February 2004.

Twenty-one flyers promoting Exploration Release Areas were produced.

The following reports were issued in the Tasmanian Geological Record series during the year:

- 1999/05 — *A blue amphibole occurrence from the northern Arthur Lineament*, by J. L. Everard.
- 2002/20 — *Western Tasmania Regional Minerals Program. Ground truthing aeromagnetic and radiometric features, northern Tasmania*, by R. Poltock.
- 2002/21 — *Western Tasmanian Regional Minerals Program — Area 3, northwest Tasmania*, by D. McP. Duncan.
- 2003/02 — *Tasmanian groundwater flow systems for dryland salinity planning*, by M. Latinovic, W. L. Matthews, C. Bastick, S. Lynch and P. Dyson.
- 2003/07 — *The geology and groundwater resources of Nine Mile Beach, eastern Tasmania*, by W. C. Cromer.
- 2003/08 — *Geology of the Mount Koonya area*, by S. M. Forsyth.
- 2003/10 — *Ground truthing of Western Tasmanian Regional Mineral Program geophysical data in the Granite Tor area*, by M. P. McClenaghan.

- 2003/11 — *A geophysical model of the major Tasmanian granitoids*, by D. E. Leaman and R. G. Richardson.
- 2003/12 — *Ground truthing WTRMP geophysical interpretations south of Macquarie Harbour*, by D. C. Green.
- 2003/13 — *Western Tasmanian Regional Minerals Program Devonian Granite Aureoles Project. Regional map set and geophysical signatures*, by K. C. Morrison, A. R. Reed and N. J. Turner.
- 2003/14 — *Western Tasmanian Regional Minerals Program Devonian Granite Aureoles Project. Tungsten prospectivity, King Island*, by N. J. Turner, A. R. Reed and K. C. Morrison.
- 2003/15 — *Western Tasmanian Regional Minerals Program Devonian Granite Aureoles Project. Devonian granitoids and prospective copper, tin and gold, northwestern Tasmania*, by N. J. Turner, A. R. Reed and K. C. Morrison.
- 2003/16 — *Western Tasmanian Regional Minerals Program Devonian Granite Aureoles Project. The Dolcoath Granite: a gold exploration target*, by K. C. Morrison, A. R. Reed and N. J. Turner.
- 2003/17 — *A review and interpretation of the Lower Palaeozoic geology of the Que River–Sheffield area, with particular reference to the Cambrian volcanic sequences*, by K. D. Corbett.

Work continued on upgrading entries on the DOMINFO database. A part-time project officer was employed to prepare rehabilitation and archaeological survey reports for inclusion in the database.

Library

The library continues to be staffed by a full-time librarian, with assistance being provided two days per week. The Workplace Standards Tasmania collection, although co-located in the Rosny Park Library, is managed separately by a permanent part-time librarian.

Technical services

The Inmagic DB/Textworks library management software was updated during the year to version 7.01.

An ongoing project of authority checking of subject headings and general cleaning up of the library catalogue commenced.

Work commenced on adding uncatalogued and ceased journal holdings to the library management software.

Cataloguing of current field notebooks in use by geologists continues as books become available.

Collection

Work has continued on collection maintenance and improved access to information. Considerable time was spent freeing up space in the compactus in preparation for

expanding the aerial photograph collection into more shelf space.

A total of 218 unpublished reports that were not previously available in the library have been retrieved from archived files, copied for inclusion in the collection, and entered in the DOMINFO database. A temporary staff member has provided assistance with this project.

A part-time project officer (funded through the Industrial Minerals and Land Management Branch) completed organising and indexing the aerial photographs collection. The entire collection was relocated within the compactus to improve access to and supervision of the photographs.

All journal subscriptions were renewed. Forty books, reports and standards were purchased during the year.

Geoscience consortium

Government geoscience libraries across Australia are investigating establishing a library consortium. Anticipated

benefits include the reduction of subscription costs (including online databases), collaborative purchasing, and resource and knowledge sharing. Librarians from each library have been contributing information and ideas which will be compiled into a report outlining options, services and recommendations.

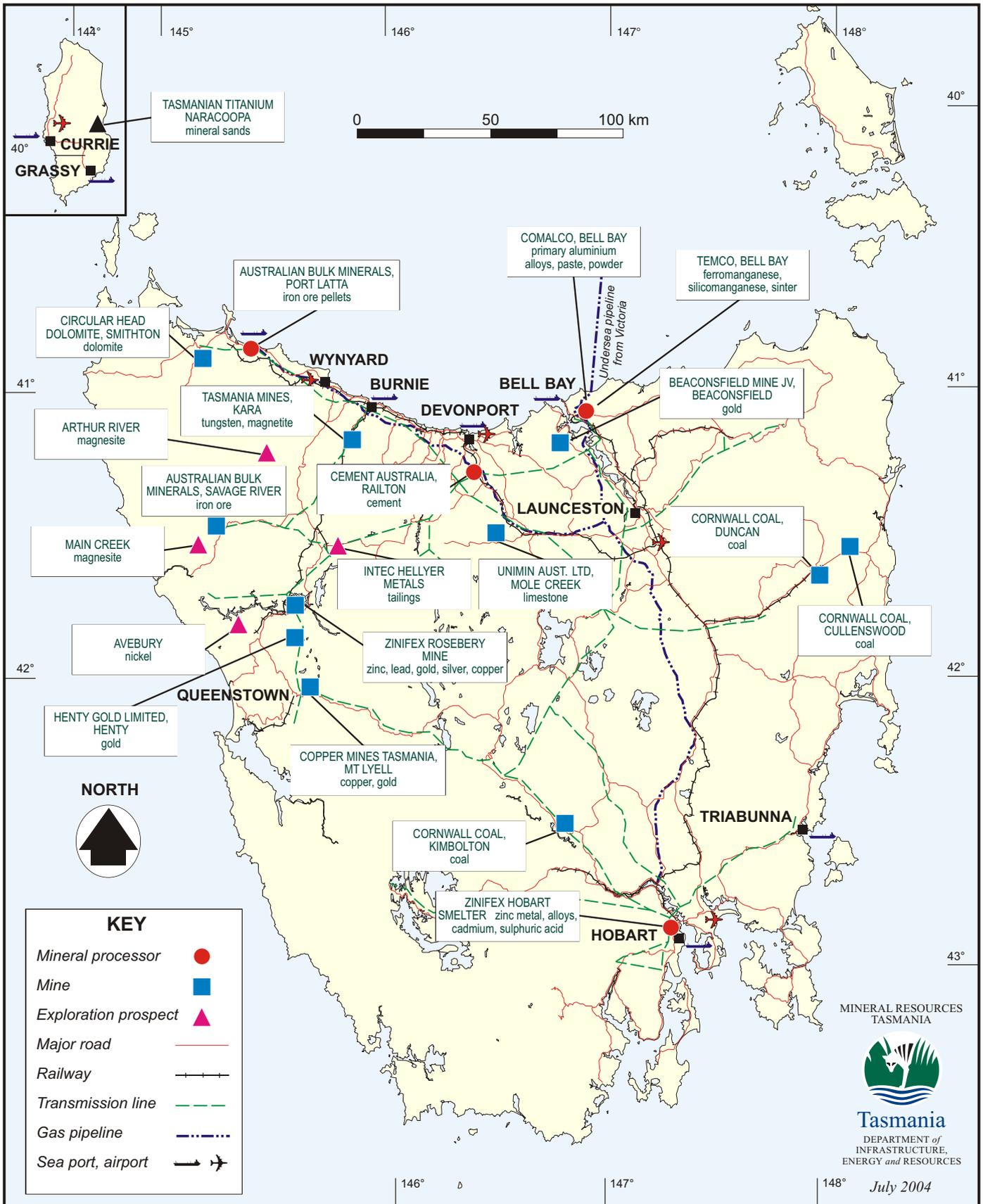
Public access facility

A public facility was established in the library providing computer access to the library catalogue and the MRT website, including document indexes and the 3-D model of Tasmanian geology.

Work experience placement

Work experience was provided through the library for a Commonwealth Rehabilitation Service placement for four weeks during March. Experience was provided in database and bibliographic searching and general library clerical duties.

Tasmania — Infrastructure, Major Mining and Mineral Processing Operations



Mineral Sector Overview

The 2003/2004 year was marked by significantly stronger prices for base metals, most of which improved markedly in Australian dollar, as well as US dollar, terms. This translated into markedly stronger performances by the operating mines, with a number reporting record production, and signs of a recovery in the level of mineral exploration.

Contained zinc, lead and copper in concentrates at the Rosebery mine again reached record levels, but production of gold doré was down, due to a higher proportion of gold and silver being recovered in base metal concentrates. Overall, the recovery of both gold and silver was higher.

Record production was achieved at the Mount Lyell mine. Stronger iron ore prices significantly improved the economic situation of the Savage River mine. Work continued on the pre-feasibility study of an underground block-cave operation in the North Pit, but by year's end no decision had been announced on whether the mine would continue as an underground operation after 2008.

Both the Henty and Beaconsfield gold mines recorded record production levels.

Allegiance Mining NL commenced construction of a decline into the Avebury nickel deposit in early March 2004 and announced that it would progress a full feasibility study in parallel with the permitting process to enable production from the mine to commence in late calendar year 2005.

Australian Tungsten Pty Limited continued investigations into the feasibility of resuming scheelite mining at Grassy on King Island. At year's end, Van Dieman Mines Pty Ltd was investigating the feasibility of commencing mining of alluvial tin, gold and sapphire in the Pioneer–Gladstone area.

Intec Hellyer Metals Pty Ltd, a wholly-owned subsidiary of Intec Limited, purchased the Hellyer mining lease and adjoining tenements from the Receiver of Western Metals Copper Limited and has reported successful results from treating the tailings from the Hellyer mine at a pilot plant in Sydney. Intec has also announced that it has agreed to purchase the assets of Encore Metals NL, with a view to treating the zinc-lead-silver bearing Zeehan smelter slag at the Hellyer site.

Improved conditions in the industry were accompanied by consolidation on the corporate front by a number of companies. The Rosebery mine became part of newly listed company Zinifex Limited on 5 April 2004. The Administrator of Renison Bell Limited announced that the assets of the company had been purchased by Bluestone Nominees Pty Ltd and by year's end work was well advanced to enable reopening of the mine before the end of calendar year 2004. The Receiver and Manager for Beaconsfield Gold NL (BGNL) retired on 12 March 2004 following successful fund raising and restructuring of debt, and the company has resumed trading on the Australian Stock Exchange.

The restored confidence of the industry was paralleled by investment in capital investment programs, including substantial new exploration projects commencing at the Beaconsfield, Henty, Rosebery and Mount Lyell mines. BGNL announced early success in the exploration project at the Beaconsfield gold mine, with an increase in reserves, allowing for mining depletion, of 37% from 31 December 2003 to 30 June 2004. It is planned to continue this exploration project into calendar year 2005.

The Australian Bureau of Statistics (ABS) reported a 77% increase in Tasmanian mineral exploration expenditure to \$7.6 million for the year, compared with \$4.3 million in 2002/03. Tasmania's share of Australian expenditure increased from 0.59% to 0.97% during the year.

Despite expenditure on mineral exploration remaining at relatively low levels, there is evidence of recovery starting in the greenfields (exploration licence) sector as well as on mining leases.

This is reflected in a marked increase in exploration licence applications from 42 in 2001/2002, to 48 in 2002/2003 to 62 in 2003/2004. While these data need to be interpreted with caution, because not all applications lead to granted exploration licences, and of these, not all exploration licences result in strong exploration programs, they do indicate a heightened level of interest in private sector mineral exploration in Tasmania.

There was continued significant progress in the nickel exploration being conducted by Allegiance Mining NL. The company reported a 24 metre-thick zone containing 0.77% nickel and 0.28% zinc at the top of a 70 metre section of weathered ultramafic host rock at the Burbank prospect west of Avebury. Allegiance also announced encouraging results from exploration for shallow and small, but high grade, nickel-copper-cobalt-platinum-palladium-gold deposits in the Melba Flats area east of Zeehan. An inferred resource of 30 000 tonnes of 3% nickel was determined for the Nickel Reward prospect, with the grades of the other elements not stated, and further promising drill intersections were reported from the Genets Winze–North Cuni area. The success of this exploration has translated into a high level of exploration licence applications for nickel in prospective areas, involving some eight companies.

The revival of gold exploration continued in widespread areas of Tasmania. Drilling programs were carried out by TasGold Limited at Golconda, Moina and Elliott Bay, by Diamond Ventures NL near Beaconsfield, by Cala Resources Pty Ltd at Mathinna, and by F.C. Bardenhagen at Lyndhurst. Significant results were achieved by TasGold at the Potoroo prospect at Golconda, with wide intersections of 106 metres at 0.24 grams per tonne (g/t) and 24 metres of 0.57 g/t gold and narrow, high-grade intersections of up to 11.2 g/t gold over 0.8 metres at the nearby Enterprise prospect.

Exploration activity was also improving for base metals other than nickel. Newcrest Operations Limited commenced a major copper-gold exploration project in the

Mount Jukes area south of Queenstown. TasGold Limited announced a significant intersection at the Wart Hill prospect, near Elliott Bay, of 3.9 metres of mineralisation grading 12.6% zinc, 7.2% lead, 123 g/t silver and 0.6 g/t gold.

A recent feature of the industry is the successful capital raising to create new exploration companies based entirely or significantly on Tasmanian projects. Over the last 15 months, two companies focussed on gold exploration in Tasmania raised capital; TasGold Limited raised \$2.32 million and Lefroy Resources Limited raised \$4.72 million. A base metal exploration company, Jaguar Minerals Limited, raised \$3.14 million to explore for base metals in Tasmania and elsewhere in eastern Australia.

The renewed activity is partly a result of the geoscientific data gathering and promotional activities conducted by

government over the last few years, including Project TIGER and the Western Tasmanian Regional Minerals Program, and a number of significant projects can be attributed to this activity. The three-dimensional geological model and prospectivity analysis of Tasmania is a world's first synthesis of such a large region involving a co-operative approach between government and industry to assist with targeting subsurface mineral deposits. It has attracted significant interest and has materially helped small companies identify areas to explore.

For the first time in more than a decade, a number of factors are combining to reinvigorate the mining and mineral exploration sectors and the outlook has improved significantly over the past year.

Commodity Prices

Demand for base metals improved markedly during 2003/2004, mainly due to the growth of China's economy. The result was that by the end of the financial year, commodity prices, in United States dollars (USD), had increased to levels not reached for many years. Commodity demand was so strong that local commodity prices broke away from the constraints of the rising Australian dollar and showed healthy rises.

During the first three quarters of the financial year the value of the Australian dollar (AUD) increased to a high of USD 80 cents, which negated much of the early USD commodity price gains. The higher the value of the AUD is against the USD, the lower the returns to local companies when USD sale receipts are converted back to the local currency. By the end of the year the AUD value had reduced to a level of around USD 70 cents, which further improved local prices. The exchange rate still remains quite high when compared to the mid 50 cent level that was experienced during 2000, 2001 and 2002.

The gold price remained strong throughout the year, floating around the \$550 level with an average value for the year of \$546. The average price was below that of the \$572 average experienced in 2002/2003.

Zinc prices remain at near historically low levels. Even though prices have improved, zinc has not been affected by the increase in demand, and resulting supply shortages, experienced by other commodities. The average prices for 2003/2004 were not significantly improved from 2002/2003, averaging \$1346 per tonne. The price at the end of the year reached \$1400 per tonne, which was a significant improvement on the \$1160 level at the start of the financial year.

Tin prices climbed steadily throughout the first three quarters of 2003/2004, and made significant gains in the last quarter, closing the year at \$13,000 per tonne after touching \$14,000 per tonne in May, levels not achieved since the late 1980s. After a number of years of depressed prices, demand for tin concentrate, particularly from China, has increased. The USD price for tin nearly doubled during the financial year, and has nearly trebled from the lows of 2002.

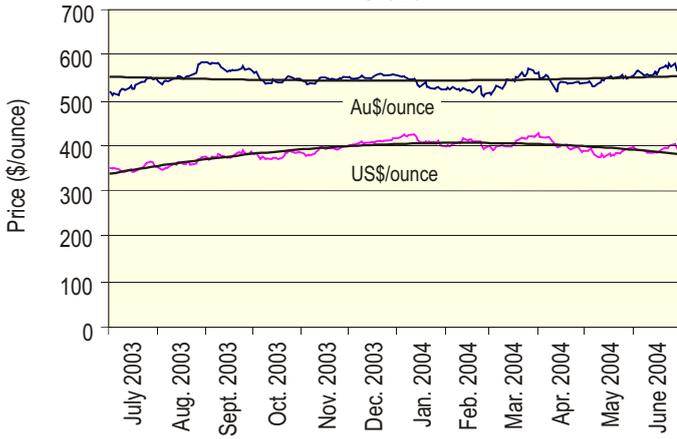
The copper price also made significant gains throughout 2003/2004, particularly in the second half of the financial year, and reached the \$4,000 mark by year end, a price which has not been achieved since 1995. Again demand from China drove the price to higher levels.

Lead prices improved, making a steady climb throughout the year and nearly doubling the opening AUD price by financial year end. Lead started the year at \$720 per tonne and finished at around \$1,260.

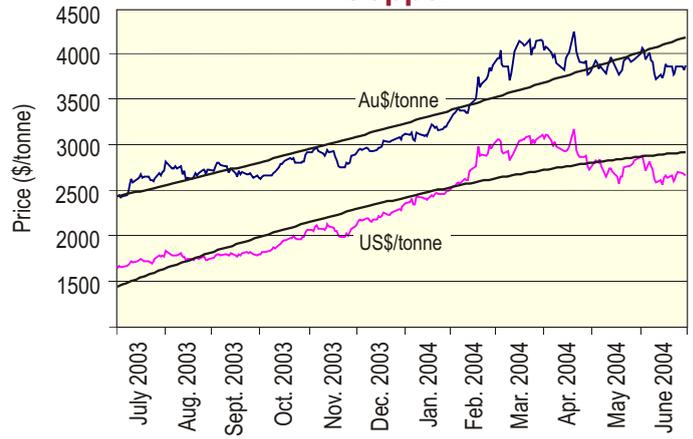
Nickel was the standout commodity for 2003/2004, rising to historical highs of \$23,000 per tonne. The price rose through high Chinese demand for nickel to be used in stainless steel production.

Iron ore prices improved during the year, with steel mills agreeing to a 19 per cent increase to suppliers. The fact that the AUD rose to nearly USD 80 cents, or by 19 per cent against the USD, negated all the gain for much of the year. The reduction in value of the AUD settled to around USD 71 cents towards the end of the year helped local iron ore producers' bottom line. The end result for the year helped claw back some of the lost ground from the AUD rising by 18 percent in 2002/2003, when only a ten per cent increase in the iron ore price was negotiated.

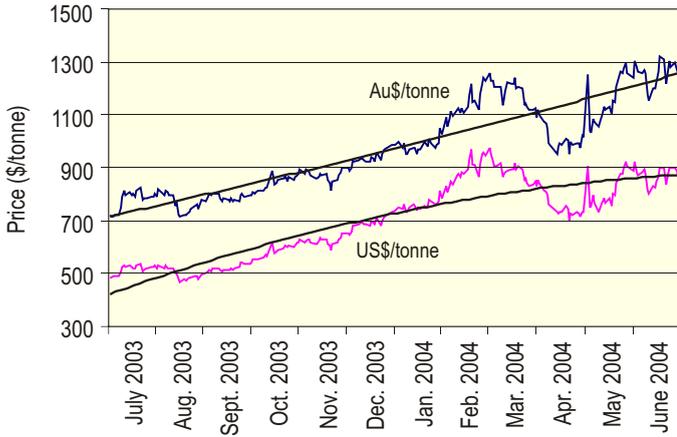
Gold



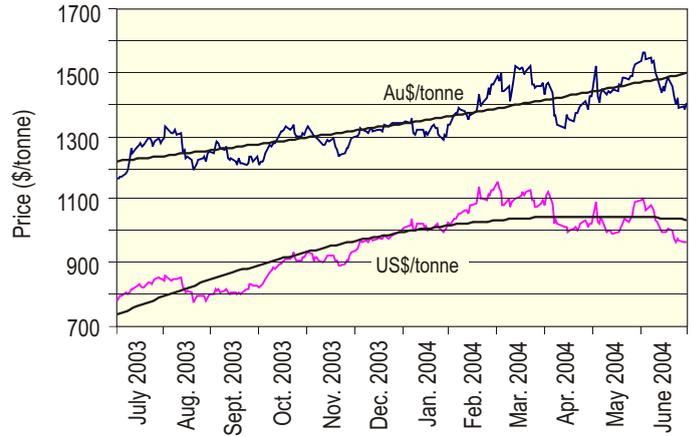
Copper



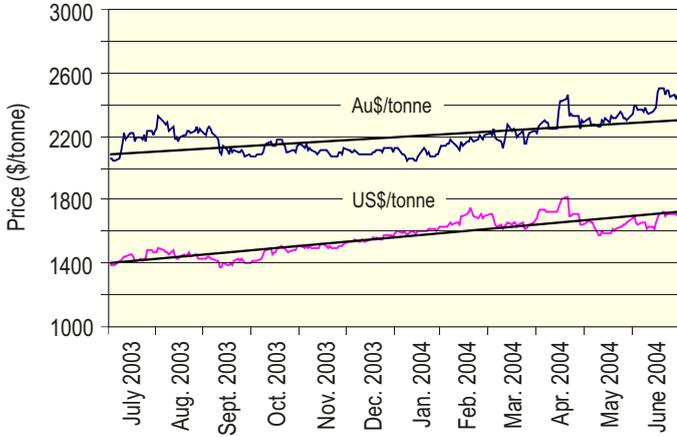
Lead



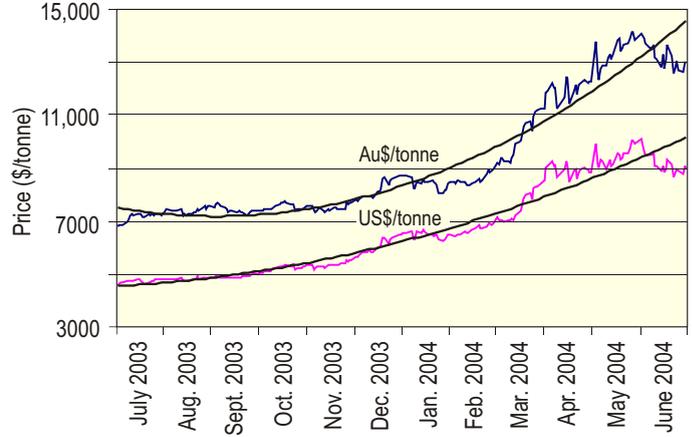
Zinc



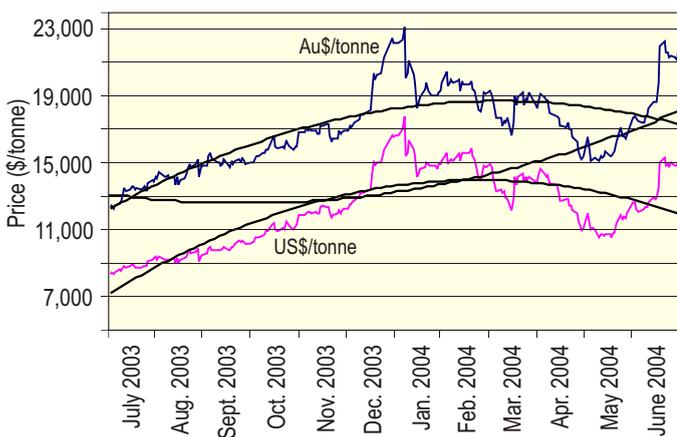
Aluminium



Tin



Nickel



Australian Dollar : American Dollar



Value of the Tasmanian Mineral Industry

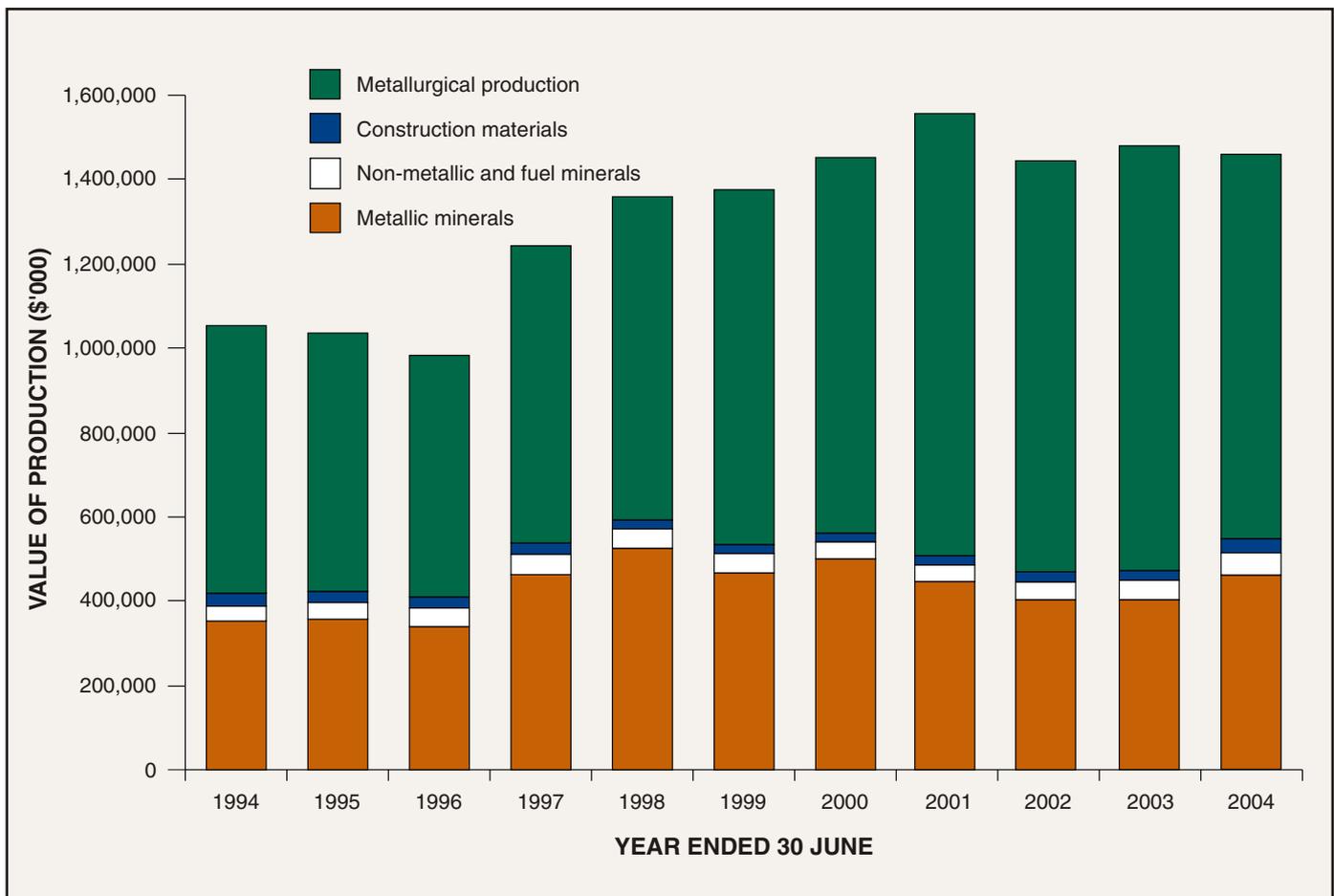
<i>Year ended</i> <i>Commodity</i>	<i>Unit</i>	<i>30 June 2003²</i> <i>Total Quantity</i>	<i>30 June 2004</i> <i>Total Quantity</i>
Metallic Minerals			
Copper (assayed)	(tonne)	32 447	30 340
Gold (assayed)	(kilogram)	7 547	10 872
Iron ore pellets	(tonne)	2 142 278	2 202 908
Iron (in magnetite)	(tonne)	62 248	62 538
Lead (assayed)	(tonne)	28 727	30 619
Silver (assayed)	(kilogram)	74 189	72 588
Tin	(tonne)	4 297	4
Zinc (assayed)	(tonne)	86 815	94 560
Value of Metallic Minerals		\$404 784 863	\$462 832 347
Non-metallic, Industrial and Fuel Minerals			
Clay –			
Cement	(tonne)	73 007	46 884
Brick	(tonne)	28 173	29 742
Other	(tonne)	100	nil
Kaolin	(tonne)	9 360	14 487
Dolomite	(tonne)	8 666	6 422
Limestone –			
Agricultural	(tonne)	138 206	135 293
Cement	(tonne)	1 685 005	1 668 804
Chemical and metallurgical	(tonne)	73 562	61 975
Other	(tonne)	63 858	57 830
Silica (glass and other)	(tonne)	128 850	135 218
Sulphuric acid	(mono tonne)	416 729	449 812
Coal (run of mine)	(tonne)	545 978	481 914
Coal (washed)	(tonne)	359 801	349 283
Peat	(m ³)	nil	nil
Gemstones	(kg)	2	9
Value of Non-metallic and Fuel Minerals		\$41 403 223	\$48 600 317
Construction Materials			
Building stone –			
Freestone	(tonne)	48	0
Other	(tonne)	1 603	2 747
Sandstone	(tonne)	1 088	1 872
Crushed and broken stone –			
Basalt	(tonne)	702 499	854 415
Dolerite	(tonne)	826 115	906 740
Limestone	(tonne)	48 111	41 056
Sandstone	(tonne)	66	202
Other	(tonne)	85 845	127 939
Gravel (aggregate)	(tonne)	27 495	40 265
Sand	(tonne)	382 645	485 245
Other road materials	(tonne)	1 961 655	1 755 607
Value of Construction Materials		\$27 223 951	\$34 040 997
Total value with Australian metal prices		\$473 412 037	\$545 473 661
Value added production from Tasmanian and other ores			
Aluminium)			
Cadmium)			
Cement)			
Ferromanganese)		\$951 385 751	\$912 027 959
Silicomanganese)			
Sinter)			
Superphosphate)			
Zinc)			
Value of mining and metallurgical production		\$1 424 797 588	\$1 457 501 620
Reported average number of employees ¹		3990	3889

1. Not all operators report full details

2. Figures for 2003 may vary from previously published results because of late or amended returns

Value of Production, 2002/2003 and 2003/2004

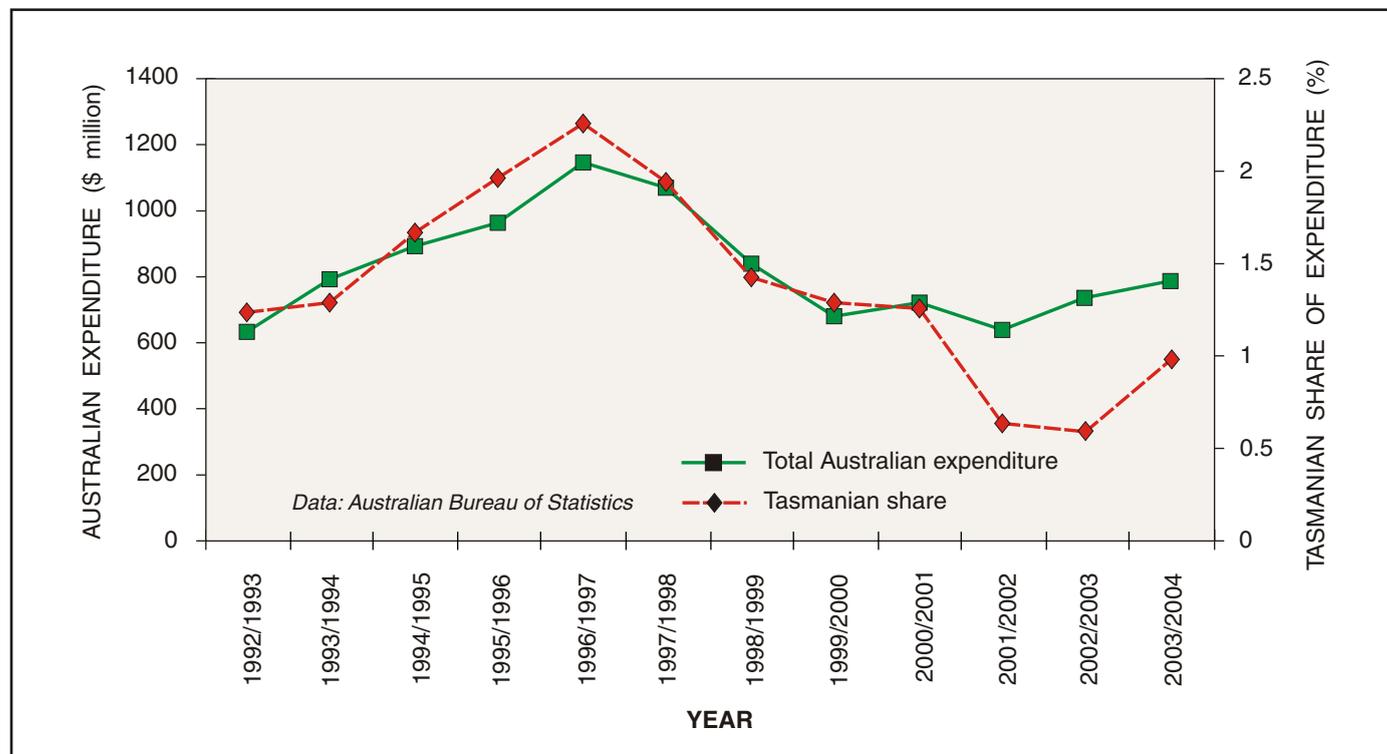
	2002/2003		2003/2004		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Gold	7.55	-	10.9	-	44.4
Silver	74.2	-	72.6	-	-2.2
Zinc	86 815	-	94 560	-	8.9
Copper	32 447	-	30 340	-	-6.5
Lead	28 727	-	30 619	-	6.6
Tin	4 297	-	4	-	-
Iron ore pellets	2 142 278	-	2 202 908	-	2.8
Total metallic minerals	-	404,785	-	462,832	14.3
Non-metallic and fuel minerals	-	41,403	-	48,600	17.4
Construction materials	-	27,224	-	34,040	25.0
Value added production from Tasmanian and foreign ores	-	951,386	-	912,028	-4.1
Value of mining and mineral processing production	-	1,424,798	-	1,457,502	2.3



Mineral Exploration Expenditure

Year	Australian Expenditure (\$ Million)	Tasmanian Expenditure (\$ Million)	Tasmania as % of Australian Expenditure
1992/1993	631.7	7.8	1.23
1993/1994	792.6	10.2	1.29
1994/1995	893.4	14.9	1.67
1995/1996	960.2	18.8	1.96
1996/1997	1148.6	26.0	2.26
1997/1998	1066.8	20.7	1.94
1998/1999	837.8	11.9	1.42
1999/2000	676.4	8.7	1.29
2000/2001	721.3	9.1	1.26
2001/2002	640.6	4.0	0.62
2002/2003	732.5	4.3	0.59
2003/2004	786.7	7.6	0.97

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



Review of Mineral Sector Operations

— Metallic Minerals

BASE METALS

Zinifex Rosebery mine

Zinifex Limited is one of the world's largest integrated zinc and lead companies. The new company has been formed to own and operate two mines, Rosebery and Century mine (in Queensland), and four smelters that were owned by Pasminco Limited.

Total ore production for the year was 785 000 tonnes grading 13.6% Zn. Production from the lower levels totalled 623 419 tonnes at 14.4% Zn and came from K and P Lens'. Production from the upper levels totalled 162 193 tonnes at 10.6% Zn, coming from remnant mining from the No. 1 Shaft Pillar as well as cut and fill stoping from 17B South and the Access I.

Mine development

Total development advance totalled 4202 metres. Capital development advance was 1257 metres which was mostly required to continue extending the K North and P declines and the P incline, in order to access future ore zones. The operating development was predominantly in the two main lower working panels, K Lens (42–46K), and P Lens (40–44P), and in Upper P Lens. Of the advance 1376 metres were in waste and 1567 metres were in ore.

Mill production

Ore treated totalled 739 417 tonnes grading 4.48% Pb, 13.71% Zn, 0.44% Cu, 117 g/t Ag and 2.04 g/t Au. This was an 8.2% decrease in tonnage treated through the concentrator compared with the previous year. The major reasons for this reduction were a 7.7% decrease in tonnage from mine production and reduced throughput to maintain metal recovery.

- Gold production as doré totalled 346 kg containing 31% silver and 67% gold. This was down by 22.1% on the previous year owing to a 33.1% reduction in gold to doré recovery. Gold head grades were up 20% on last

year but the gold to doré recovery was down due a change in mineral association.

- Copper metallurgy improved from the previous year. A 29.4% increase in head grade and a 24.2% improvement in recovery resulted in a 44.1% increase in concentrate production to 10 395 tonnes grading 7.15% Pb, 20.46% Cu, 2868 g/t Ag and 70 g/t Au.
- Lead concentrate output increased by 2.3% on the previous year to 43 141 tonnes at 64.01% Pb and 873 g/t Ag, mainly due to a 14.9% increase in head grade on last year.
- The high purity zinc concentrate of the previous year was sustained. Zinc concentrate output increased by 9.4% to 155 208 tonnes at 57.17% Zn, mainly due to a 20.3% increase in head grade.

Reserves (as at March 2004)

Overall resources decreased by 1.705 million tonnes compared to the previous year due to deletions from mining and revision to resources. Reserves increased by 478 000 tonnes compared with March 2003. This was caused by conversion of inferred resources to reserves, mainly in K lens, and revisions, mainly in P lens. The increases were offset by depletions from mining and revisions in the Upper Levels remnant mining reserves.

Identified ore reserves and resources at March 2004 comprised:

Reserves	Tonnes (000s)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
Proved	2,450	4.3	15.5	0.45	149	2.2	9.0
Probable	317	3.9	13.4	0.32	131	2.2	9.2
Total	2,767	4.2	15.3	0.43	147	2.2	9.0

Drilling

A total of 25 895 metres of diamond drilling was completed. The main areas of investigation were K Lens North and at depth below P Lens.

Identified Mineral Resources, March 2004

		tonnes (000s)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
Rosebery	Measured	2 741	5.2	19.6	0.58	202	3.0	11.3
	Indicated	868	4.5	16.0	0.62	160	3.4	14.2
	Inferred	3 032	4.5	15.4	0.46	191	2.2	9.8
	Inaccessible	1 953	3.4	11.4	0.71	110	1.9	15.1
	Total Meas+Ind+Inf	6 640	4.8	17.2	0.53	191	2.7	11.0
South Hercules	Total	560	1.9	3.7	0.11	157	3.0	4.4
GLOBAL	Meas + Ind + Inf	7 200	4.6	16.2	0.50	188	2.7	10.5

Capital expenditure

Capital expenditure during the year totalled \$10.7 million. The major projects included:

- underground development and construction of an underground pump station;
- purchase of an underground truck and underground light vehicles;
- raising the wall of the tailings dam; and
- concentrate handling upgrade

Employment

A total of 194 people were employed in the mine. Four lost-time accidents were sustained.

The mining department achieved a record 506 days LTI free. OH&S management programs are focussed upon behavioural systems and catastrophic risk management. The site is moving towards AS4801 certification. A total of 73 Process Improvement Opportunity strategies were submitted by employees during the year.

Environmental management

ISO14001 Environmental Management System certification has been maintained, and over 200 site employees and contractors have undergone environmental training. Improvements to environmental risk management and compliance management have been completed that will facilitate ongoing improved performance of the operations.

An estimated 605 000 tonnes of mill tailings were pumped to storage in the Bobadil tailings dam during 2003/2004. The dam wall was raised during the summer and included modifications to the polishing pond that will enable better management of discharge water quality.

The Hercules EIP was concluded and formal closure of the site was initiated. A closure plan developed in consultation with the community and other stakeholders will be prepared by October 2004.

Biological monitoring of macro invertebrates has been initiated in the Ring River and Stitt River. Results from the Stitt River are encouraging and indicate the existence of a healthy population of fish. The results for the Ring River identify significant impacts as a consequence of historical mining practices around the Hercules site.

A full three-year environmental management plan review was completed. It is hoped that the EMP review will form the basis for modifications to the permit to fully reflect the nature of the operations. A review of rehabilitation requirements and closure obligations was completed. As a consequence more detailed and comprehensive closure plans and rehabilitation strategies will be developed co-operatively with the Department of Primary Industries, Water and Environment during the coming year.

Community relations

Zinifex Rosebery Mine continues to support the local communities through grants and sponsorship of sporting teams and community groups. Education and training support amongst the community has been maintained and included:

- Eleven apprentices sponsored through Northern Group Training/William Adams and Caterpillar Elphinstone.
- Education assistance to 15 eligible dependants of employees (12 at university and three attending college).

During late 2003 a MOU was signed with the Rosebery District High School for the relocation and establishment of the mine nursery to the school as an applied learning project. Community consultation and liaison with the community and key stakeholders has been completed as part of the Hercules mine closure process.

Intec Hellyer Metals Ltd

Intec Limited purchased the Hellyer tails resource, mill infrastructure and exploration licenses/leases from the Receiver for Western Metals Limited in January 2004. Intec Limited is a proprietary hydrometallurgical technology development company. Ammtec Limited purchased the metallurgical research facility at River Road, Burnie. Ammtec is a Perth-based commercial metallurgical testwork company.

At year-end Intec had one full-time employee in Tasmania, with three sub-contracted employees undertaking Hellyer care and maintenance activities. The Burnie research laboratory employed six people full time and one part time.

The Hellyer concentrator and services infrastructure remained on care and maintenance pending discussions with local mining companies on toll treating ore through Hellyer. Other options for the mill equipment were also being considered.

The Hellyer tailings resource contained in a water-covered storage dam comprise 10.88 million tonnes at 0.16% Cu, 3.0% Pb, 2.8% Zn, 88 g/t Ag and 2.6 g/t Au.

Hellyer Metals Project

The project aim is to process Hellyer tails and possible smelter waste feedstocks containing zinc and precious metals to produce zinc metal, copper oxychloride, lead and silver contained in a cement product, and gold bullion at the Hellyer mine site. The Intec Polymetallic Leach process includes chloride leaching of tails and smelter waste, zinc liquor iron removal with limestone, zinc dust cementation of lead and silver, zinc liquor purification and electrowinning.

Progress to June 2004 included:

- Pilot plant testing of the Intec Polymetallic Leach process at Brookvale in Sydney. The testwork campaigns confirmed high extractions of zinc, lead, silver and copper. Gold extractions were lower due to the refractory nature of the gold.
- A pre-feasibility study was undertaken by HG Engineering Company in Canada. The outcome of the study was positive, with the next phase to construct a demonstration plant at the Burnie Research Labs in late 2004.
- Discussions were held with several parties who own zinc-rich residues that may be amenable to reprocessing at the proposed Intec plant. These discussions are ongoing.

Intec Limited will be undergoing a capital raising program in September/October 2004 to enable it to undertake further development of the Hellyer process and on other proprietary Intec process development opportunities.

Intec Hellyer Metals Ltd also undertook a study into base metal and gold exploration opportunities on the Hellyer, Que River and Mt Charter leases. The aim was to encourage third party exploration of select targets. Discussions with potential explorers are continuing.

Zeehan Zinc — Comstock Mine development

Earthmoving operations having being directed towards completing the rehabilitation of the Central Waste Rock Dump, and the preparation of road access to the base of the Swansea Tramway Dump. This required the movement of approximately 30 000 tonnes of clay and waste.

Employment

Up to a total of forty people were employed during the year.

Reserves

Zeehan Zinc has continued an ongoing review of resources along the Balstrup Fault. Renison Goldfields Consolidated Exploration Pty Ltd had calculated resources of 6 Mt at 5.5% Zn, 3.3% Pb and 40 g/t Ag, while Western Metals Limited had calculated resources of 5.1 Mt at 4% Zn and 3.3% Pb.

COPPER

Copper Mines of Tasmania Pty Ltd — Mt Lyell mine

The company reports that it remains committed to the continued operation of the Mt Lyell site. Investment in various projects has resulted in the cost per tonne of copper produced being maintained. Development of the decline to the next production level, as well as level access development, was completed. The company continues to seek ways to improve production while improving the cost structure.

Production

Production from the Prince Lyell mine was 2 514 484 tonnes at 1.22% copper and 0.3 g/t gold. Production levels were lower than the previous year, although the mine produced at record tonnes for a three-month period, until production was rescheduled to meet processing performance. Waste mined totalled 53 054 tonnes.

Development

A total of 305 metres of decline development were completed as well as 318 metres of access development in waste. Total development (ore and waste) for the year was 3039 metres. Planned development for 2004/2005 is

2940 metres, including development of the decline to access the next level at 1465 mRL.

Reserves

Total Mineral Resources at 30 June 2004, at 1% Cu cut-off, were estimated at 36.09 million tonnes at 1.26% copper and 0.34 grams of gold per tonne. Measured and Indicated Mineral Resources total 11.06 million tonnes at 1.33% copper and 0.36 grams per tonne of gold.

The June 2004 Mineral Resource has not been converted to an ore reserve. The 2003 total ore reserve, depleted for production (2.5 Mt), was 4.50 Mt @ 1.29% Cu, 0.30 g/t Au.

Processing

A total of 2 465 398 tonnes of ore was processed producing 95 742 dmt of copper concentrate grading 28.70% Cu, 4.9 g/t gold containing 27 478 tonnes of copper and 15,432 ounces of gold. Processing plant performance has declined from the previous year, as throughput rates have been affected by the quality of material being processed. Main problems were in the tertiary and quaternary circuits where difficulties occurred with sticky, fine material, resulting in blockages. Increased quaternary screen and crushing capacity was installed to overcome the bottleneck. Further improvements to the fixed plant are being assessed and considered to improve both consistency of performance and throughput rates.

Capital expenditure and projects

Total capital expenditure for the year was \$3.744 million. Major items included extension of the main decline below 1490 mRL, as well as level access, a pump station, and a replacement ventilation system in the lower part of the mine. On the surface, capital was spent on a 140 mm Symons crusher and associated quaternary circuit upgrade.

Employment

The operation employed 250 people. Numbers varied from the previous year due to changes in shift roster patterns and variations to production and development schedules in the mine. CMT directly employed 94 people, with 12 in the mine, 39 in metallurgy, 29 in maintenance and 14 in administration. Barminco, the underground mining contractor, employed 150 people on site in the areas of mine production, crushing, mobile and fixed plant maintenance and administration. It is planned to continue with the use of an underground mining contractor to undertake all production, development and services work in the mine. Additional contractors are used as required for shutdown and project work.

Rehabilitation and pollution control initiatives

Copper Mines of Tasmania has active programs of environmental improvement and pollution control at the Mount Lyell mine site and Princess Creek tailings storage facility. Significant environmental projects during the year included:

- Continued rehabilitation of the intermediate stage of the waste rock dump. This includes forming of a water shedding landform and compacted clay cover. Revegetation is in progress.

- ❑ Continued reduction in size of the operations footprint. This includes ongoing clean up of the historic site and planning for progressive removal of redundant, low heritage value infrastructure and establishment of native vegetation.
- ❑ Sustained improvement of water quality released from the tailings dam, with no breaches of water quality since August 2002. Includes active management of decant pond water levels and strategic placement of tailings in storage. Planning for a raise of the tailings dam wall during the summer of 2004/2005 is in progress.
- ❑ Active programs of environmental awareness raising, including a site environmental newsletter, increased environmental profile, advancement of the site EMS and improved documentation.
- ❑ Continual improvement in stormwater drainage management on the mine and mill site, including closure of old drains and construction of additional sediment traps.

CMT met its obligations to neutralise acid drainage generated by its mining operation, using co-treatment with alkaline tailings, and is working closely with the government to reduce the acid drainage load from historic mining operations. Government-funded drainage improvements have successfully segregated the most intensely polluted water from clean water, in preparation for potential treatment of the acid drainage.

Gold

Beaconsfield Mine Joint Venture

The joint venture reports that production for 2003/2004 was a record for tonnes of ore mined and milled and ounces of gold produced. The one millionth tonne of ore was milled on 22 June 2004. Coincidentally, this milestone was achieved on the 40th anniversary of the day on which the first modern diamond-drill hole was collared.

Production

A total of 4670 kg of gold and 534 kg of silver was produced from 234 440 tonnes of ore milled. Waste mined during the year totalled 157 114 tonnes, of which 52 156 tonnes was utilised as backfill underground with the remainder hoisted to the surface. The majority of the waste rock hoisted to the surface was utilised for the final stage of construction of the tailings dam.

Major projects

Construction of the tailings dam was completed, with sufficient capacity until mid 2007. A major underground diamond drilling program commenced with the aim of extending the resource and generating an ore reserve sufficient for five years production from mid 2005. Almost 9000 metres of drilling was completed in the six months to June 2004 with an additional 17 000 metres considered likely over the course of the next year.

Reserves

The ore reserves reported at 30 June 2004 comprised:

Measured Resource	149 000 tonnes at 29.8 g/t Au (143,000 ounces contained gold)
Indicated Resource	400 000 tonnes at 22.2 g/t Au (285,000 ounces contained gold)
Inferred Resource	586 000 tonnes at 19.0 g/t Au (358,000 ounces contained gold)
Total Resource	1 135 000 tonnes at 21.5 g/t Au (786,000 ounces contained gold)
Proven Reserve	226 000 tonnes at 17.9 g/t Au (130,000 ounces contained gold)
Probable Reserve	510 000 tonnes at 15.3 g/t Au (251,000 ounces contained gold)
Total Reserve	736 000 tonnes at 16.1 g/t Au (381,000 ounces contained gold)

Capital expenditure

Capital expenditure for the year totalled \$7,954,753. Major items of capital included:

- ❑ the installation of a new regrind ball mill at the processing plant and rockbreaker over the grizzly on the underground hoisting system;
- ❑ commencement of a major underground resource diamond-drilling program;
- ❑ completion of the final lift on the tailings dam;
- ❑ construction of a second stock tank on the bacterial oxidation circuit;
- ❑ installation of forward-facing cabs on two of the three underground trucks;
- ❑ purchase of a new telehandler; and
- ❑ a geotechnical site investigation at the site of a proposed new tailings dam.

Employment

At year end, the joint venture employed 134 people of whom eight were in technical services, 79 in mining, 36 in processing, eight in administration and two in occupational health and safety. Contractors were engaged for some mining and maintenance services, security, surface ore haulage and the assay laboratory.

Environmental management

With the completion of the final lift of the tailings dam to 90 mRL, the outside batter slopes were covered with a layer of soil which had been stockpiled for the purpose, and then hydro-mulched. At this stage a good strike of stabilising rye grass has occurred and it is anticipated that native seed will start to grow in the coming spring.

A statutory revision of the project environmental management plan was completed early in 2004. In addition to the EMP review, the joint venture has undertaken several environmental studies including a baseline biological study of Brandy Creek and Middle Arm Bay, and water quality monitoring of Middle Arm Bay. A mine closure plan was also completed.

Placer Dome Asia Pacific — Henty Gold mine

Production from the West Coast mine totalled 4389 kg of gold and 1008 kg of silver, with 289 000 tonnes of ore and 63 000 tonnes of waste being mined. Mining of Zone 15 and the Intermediate Zone was completed. Development of the main Darwin South infrastructure was completed and mining was started in the orebody.

Reserves

Resources and reserves as at December 2003 comprised:

Measured + indicated resource	994 000 tonnes at 11.6 g/t Au (369,000 ounces contained gold)
Inferred resource	300 000 tonnes at 8.7 g/t Au (84,500 ounces contained gold)
Total resource	1 294 000 tonnes at 10.9 g/t Au (454,000 ounces contained gold)
Proved + probable reserves	973 000 tonnes at 10.6 g/t Au (333,000 ounces contained gold)

Rehabilitation, environmental and pollution control initiatives

The operation's first stand-alone environmental policy came into effect during the year. This policy was developed through a consultative process with all site personnel, and states the company's commitment to preservation of the environment.

The site achieved a significant reduction in greenhouse gas emissions, due largely to reductions in diesel consumption and explosives usage. The diesel consumption reduction resulted from a number of factors:

- Winding down of mining in the upper reaches of the mine, resulting in less travelling for equipment moving between operating locations.
- Cessation of direct trucking of ore from underground to surface.

The reduction in explosives usage was achieved by a change in mining methods. This was made possible by changes in orebody characteristics and ground conditions.

The annual biological monitoring survey of the Henty River upstream and downstream of operations continued to confirm that the mine is having no impact on stream fauna. This was the eleventh year that the mine has carried out this survey, which is a good indicator of the mine's performance with respect to managing pollutant levels in discharge water.

A review and update of Henty's Environmental Management Plan was submitted to the Department of Primary Industries, Water and Environment. This review outlines changes to the operation in the past three years, and planned modifications for the coming three years.

Capital expenditure

Capital expenditure totalled \$12 million during the year. Major items included a paste fill plant, underground equipment, two trucks, a loader and a drill rig.

Employment

The operation employed 173 people, including 64 contractors.

Safety program

The company has developed an implementation plan to continually improve safety performance at Henty. Features include a management information system, team involvement, training programs and supervision.

Iron ore

Australian Bulk Minerals (Savage River Mines)

Mine life has been extended to May 2009 through the development of Centre Pit South. A pre-feasibility study of the potential to continue ore extraction from North Deposit using underground mining methods, after the exhaustion of open pit reserves, was completed. The study indicated that underground mining using a block caving mining method was technically feasible. Although the project is marginal, the operation may prove attractive for a long-term supply of iron ore pellets, particularly in current market conditions. Interest is being sought to advance the project.

Employment

A total of 444 people, including contractors, are employed in the operation, with 189 in the mine, 98 in the concentrator and 157 in the port, pellet plant and administration.

Production

Production from the Savage River mine totalled 1.3 million cubic metres of iron ore and 7.8 million cubic metres of waste, a total of 9.1 million cubic metres mined. Of this 5.09 million tonnes of ore were milled. Pellet production totalled 2.2 million tonnes, with 2.1 million tonnes of pellets, 9300 tonnes of concentrate and 71 000 tonnes of chips being sold.

Reserves

Resources at the end of June 2004 comprised:

North pit	88.9 million tonnes @ 51.7% DTR
South deposit	29.2 million tonnes @ 41.7% DTR
Centre pit south	59.7 million tonnes @ 48.9% DTR
Centre pit north	70.3 million tonnes @ 51.0% DTR
Total	248.1 million tonnes @ 49.6% DTR

Diluted recoverable reserves comprised:

North Pit	15 million tonnes @ 51.1% DTR
Centre pit south	9.9 million tonnes @ 47.1% DTR
Stockpiles	0.507 million tonnes @ 38.8% DTR

Capital expenditure

A total of \$3.9 million was spent on capital expenditure during the year. Major programs included tailings pipeline, diamond drilling, ball mill replacement, geotechnical equipment, south centre pit dewatering, control systems, furnaces and electrical upgrades at Port Latta.

Environmental and rehabilitation activities

Weed management was carried out at the former Savage River town site. Revegetation of land to the west of the stye at Port Latta continued, with weed management and replanting. The company continued to fund the Coastcare program from Rocky Cape to Port Stanley. Dust deposition was measured at Cowrie Point and Crayfish Creek by high volume air sampling with selective PM10 inlets. The annual averages were 25.92 and 22.82 $\mu\text{g}/\text{m}^3$ respectively.

In situ classification and separation of waste rock from the pits has continued. Waste from south deposit was placed along the eastern boundary of B dump in clay-lined cells with an alkaline rock cover. Alkaline rocks were also placed to increase the length of the Broderick Creek waste dump flow through. These measures helped to achieve satisfactory copper levels in Savage River.

Nickel

Allegiance Mining NL

This company has identified an important nickel resource at Avebury, six kilometres west of Zeehan, after several years of successful exploration. Following the issue of a mining lease, assessment by the Department of Primary Industries, Water and Environment, and development approval from the West Coast Council, access and infrastructure work commenced in January 2004. Work undertaken includes:

- access and infrastructure is under construction;
- development of the 1200 metre Viking Decline to provide access to the Viking and North Avebury deposits commenced;

- 10 000 metres of core drilling, metallurgical test work, and mine design studies are planned.

Anticipated cost for this investigation stage is \$9.5 million and is scheduled for completion in February 2005. Technical information will be used to prepare a definitive feasibility study on the commercial development of Avebury. With the completion of the study Allegiance will have spent \$16 million on the Avebury project.

The total indicated and inferred resource of the deposit is 4.06 million tonnes at 1.5% Ni, representing 61 500 tonnes of nickel.

Tin

Bluestone Mines Tasmania Pty Ltd

This company acquired the Renison Bell mine following its closure and flooding. Dewatering and rehabilitation of the operation commenced in April, providing employment for twelve people and additional contractors.

Reserves

The total measured, indicated and inferred resource is 4.1 million tonnes at 1.75% Sn. Proved and probable reserves are 1.1 million tonnes at 1.60% Sn. Identified tailings resource is 17.9 million tonnes at 0.42% Sn.

Capital works

Expenditure on mine rehabilitation totalled \$3.6 million.

Industrial Minerals

Limestone and dolomite

Beams Bros Pty Ltd

Operations continue to employ 22 people. Production for the year comprised:

Metallurgical grade limestone	15 000 tonnes
Metallurgical grade dolomite	45 000 tonnes
Agricultural grade limestone and dolomite	77 000 tonnes
Dolomite	12 000 tonnes

A total of 22 000 cubic metres of waste stripping was carried out at Flowery Gully and Cressy. Access development was carried out within both quarries. Revegetation was carried out at the Cressy waste dump and at Flowery Gully.

Circular Head Dolomite and Trading Co. Pty Ltd

This company produced 19 000 tonnes of dolomite screenings, 30 000 tonnes of powder and 8000 cubic metres of ready-mixed concrete. Thirteen people were employed. Reserves at the Smithton leases are extensive.

Capital improvements include the provision of a portable jaw crusher and generator, a truck, and improving capacity by installing a larger screen. Exporting material for magnesium production is being investigated.

Unimin Australia Limited

This company operates a limestone quarry and calciner at Mole Creek. Twenty-nine staff were employed throughout the financial year, comprising 21 in the quarry and lime plant operation, one in maintenance, two in administration and five in management and sales.

Production

Total limestone production was 147 340 tonnes, which included 12 826 tonnes of crushed rock and 1282 tonnes of

screened rock. The remaining production was for agricultural use and calciner feed.

Reserves and resources

Feed for the kiln was predominantly high-quality and medium-quality limestone with some additional low quality as the use of the resource is optimised and product quality improved.

Feasibility work on a new agricultural lime plant was completed. Whole-of-life stripping ratio and reserves of high, medium and low quality limestone have been reviewed and upgraded and the life of the resource significantly extended.

Major projects

Work is continuing on a number of projects connected with ensuring a long-term future for the operation. New dust collectors were installed to the quicklime and hydrate systems at a cost of around \$200,000. Approval was granted and design work commenced on the replacement of the kiln top with a new and improved design at a cost of around \$400,000. Numerous small OH&S and environmental projects continued to the value of \$100,000.

Rehabilitation and environmental control

Normal procedures in line with Department of Primary Industries, Water and Environment licence conditions continued.

Stack emissions tests were carried out to verify compliance at normal operating levels. Work continues on addressing compliance at elevated kiln production levels, with design work well in hand on new dust removal equipment.

Boundary noise was measured and a fugitive dust management plan was prepared.

The total area disturbed by operations remains at approximately 47 hectares. No land has been rehabilitated to date but a site rehabilitation and closure plan has been prepared.

Construction Materials

Boral Construction Materials Group Ltd

The company continues to produce from twelve quarries around Tasmania. Production exceeded 500 000 tonnes, 45% of which was road making material. Operations employed 23 people and six subcontractors. A total of 23 000 tonnes of overburden was removed from quarries at Bridgewater, Flowery Gully, The Nook and Remount Road, Launceston.

Rehabilitation continues at the former limestone quarry at Mt Nassau (Granton), and at Launceston. Rehabilitation has commenced at McGrath's quarry near Breadalbane, and at South Arm. Upgrading of screens and walkways was carried out at the Launceston Quarry.

Caroline Quarries

This company reported production of 14 300 tonnes of silica sand from their Railton quarry, providing employment for one permanent and two part-time employees.

Duggans Pty Ltd

The company reports an increased level of production for the year. Production of road making materials, concrete products, construction materials and ready-mixed concrete exceeded 100 000 tonnes. Nine people were employed. Capital expenditure included a primary crusher, a loader and excavator. Investigations were made into the potential use of crushed sandstone for sand products.

Environmental works include maintenance of sediment dams, rehabilitation and dust control. All waste material from the concrete batch plant is recycled. Waste from precast concrete products is utilised in road base to meet Australian Standard HB 155-2002.

Gunns Limited — Northeast quarry operations

This company operates 31 quarries in northeast Tasmania for road making operations, mainly in connection with forestry activities. Production for the year was 56 000 cubic metres of road gravel. Up to thirty people were employed at the height of the construction season. The operations are intermittent and nearly all operations use subcontractors. Reserves are plentiful for the foreseeable future. Four new quarries were established during the year. A source of aggregates on the East Coast continues to be elusive. A total of \$20,000 was spent on progressive rehabilitation and drainage works.

Hanson Construction Materials

The 2004 year was an exciting one for the company, with the name change from Pioneer Concrete from 1 July and the acquisition of Besser Tasmania, now known as Hanson Building Products. Hanson also purchased the Calder quarry from Besser on 1 January.

Thirteen employees and contractors were employed in administration and production. Production for the year exceeded 260 000 tonnes of crushed rock at Hobart, and 30 000 tonnes of sand from Calder since January 2004.

Rehabilitation continues in all areas, with a focus on eliminating pampas grass. Overburden stripping of RL 170–165 has been stockpiled for future rehabilitation work. A trial of foam water mixture for haul road dust suppression is being carried out.

A sales loader was purchased during the year. A development application has been submitted to the Clarence City Council to extend quarry reserves to RL305. The result of this application is awaiting the outcome of a new planning scheme.

Industrial Sands and Silica Pty Ltd

This company reported production of almost 11 000 tonnes of sand and gravel and that two people were employed.

Island Resources

Eight people, including contractors, are employed in the operation in northeast Tasmania. A total of 94 000 tonnes were produced, with major products being concrete and foundry sand and road gravel. The leases contain extensive sand and gravel reserves. Major projects undertaken during the year included the completion of a gas-fired drying plant at an estimated cost of \$400,000.

Norske Skog

This company reports producing 86 000 tonnes of crushed rock for road construction and maintenance, with some 32 kilometres of new roads being constructed. Fourteen people, including contractors, were employed in the quarrying operations. Principal pits worked were Bannisters, Maynes, Mt Lloyd, Puzzle and West Uxbridge. Material is extracted using a combination of drilling, blasting and crushing, or by direct excavation where possible. The company has fourteen quarries in State Forest and eight on private property. Life of the current pits is 10 to 15 years.

The company has an annual budget of \$30,000 for rehabilitation of quarries. Work includes regrading, planting vegetation and fertilising at sites where production

has ceased. Junee, Shoobridge and Rayners quarries are in an advanced stage of rehabilitation. Continuous maintenance includes clearing silt traps, and the placement of stockpiles of overburden and topsoil for rehabilitation work.

RNB Trading Pty Ltd

This company reports that 97 000 tonnes of building sand were produced at South Arm. Four people are directly employed. Representations were made for the development of the Clarence Planning Scheme with respect of extractive industries which supply the Hobart region.

Stornoway Quarries Pty Ltd

This company reported the production of 189 000 tonnes of structural and pavement materials, mainly from the

Raeburn quarry. Reserves provide for approximately ten years life. Capital expenditure was \$250,000. Operations are controlled through an integrated environmental management system incorporating ISO 9002, ISO 14001 and AS4801.

Treloar Transport Co.

Approximately 45 000 tonnes of crushed rock were produced, with base course for road construction being the chief product. Quarrying directly employed five people. Rehabilitation utilising limestone was carried out to mitigate the effects of pyritic leaching. Developments include planning for a crushing plant and G6 compliance (geological survey for road specification quality control).

Fuel Minerals

Cornwall Coal Company NL

A total of 61 people were employed in mining, processing and administration, with a further 17 contractors employed in open-cut operations and raw coal transport.

Duncan Colliery

Production continued throughout the year using a combination of pillar development and pillar extraction. All underground production from the Fingal Valley was concentrated at the Duncan Colliery.

Cullenswood open cut

The bulk sample operation continued throughout the year, with product proving satisfactory for customer requirements. A development application is in preparation to enable mining within the rest of the lease.

Kimbolton Coal

All major environmental works were completed prior to coal extraction commencing. Three strips were removed during the year with the majority being sent to a local customer. The characteristics exhibited by the product coal created difficulties in handling and use. Mining was suspended while the difficulties were investigated and activities were relocated to Cullenswood.

Production

Production for 2003/2004 totalled 504 674 tonnes. This coal was sourced from:

Duncan	436 736 tonnes
Cullenswood	15 192 tonnes
Kimbolton	52 746 tonnes

An additional 1250 tonnes of coal was purchased.

Washery throughput of raw coal totalled 475 857 tonnes to produce 335 538 tonnes of saleable coal at a washery yield of 66.76%. Coal sales totalled 393 370 tonnes.

Approximately 140 319 tonnes of reject materials were deposited at the Duncan reject dump.

Reserves

Coal resources exceed twenty years life.

Capital expenditure

A total of \$2.9 million was spent on plant and equipment throughout the year, the major expenditure being a mini wall mining system for the Duncan Colliery. This will be brought into production in 2004/2005.

Laboratory facilities were upgraded with the addition of a specialised oven.

Fuel distribution was upgraded with the purchase of diesel storage.

Rehabilitation

Blackwood Colliery was rehabilitated and seed was applied using local species. Huntsman No. 2 open cut was revegetated using local species. An ongoing monitoring program is in place to determine germination and growth rate.

Mineral Processing Operations

Cement Australia Holdings Pty Ltd

This company reported a continued high demand for cement products for the building and construction industries in Tasmania and in mainland States. A total of 163 people are employed on site, including 155 in mine and plant operations.

Production

Production at the Railton cement plant totalled 1.115 million tonnes of clinker which is a record for the operation. A total of 1.205 million tonnes of cement was produced from the clinker, of which 1.086 million tonnes was shipped to markets in Victoria and NSW. Sales of the remaining production comprised 78 900 tonnes sold in bulk in Tasmania, and 43 000 tonnes of bagged cement.

Capital expenditure

A total of \$3.7 million capital was spent during the year. This included completing the upgrade of the plant's control system and electrical infrastructure.

Development

An extensive exploration program commenced in February 2004 to further define the deposit. The program is expected to finish in August 2004 and will include approximately 3000 m of diamond core drilling, 2500 m of RC drilling and over 1000 m of air core. The data collected will be used to update the ore block model with a view to further optimization of the pit design and to investigate opportunities within the existing leases.

A total of 298 000 cubic metres of clay was taken from the northwest cutback of the New Mine during the last financial year. This area of the pit is now providing good quality limestone for cement production. A total of 2331 cubic metres of topsoil was stripped and stockpiled for rehabilitation in the future.

Environmental management

A Site Water Management Plan has been adopted for the management of groundwater and surface water from mining and cement manufacturing operations. The plan includes concrete lining of hundreds of metres of drains and the transformation of the disused open cut into a lake, which will act as a settlement pond. Both of these activities are designed to minimise sediment discharge to local waterways to acceptable levels and to protect vulnerable species downstream.

The environmental management plan was updated to reflect current practices and plans for rehabilitation and complies with higher internal Cement Australia policies that were recently introduced.

Regular environmental activities, such as the measurement of groundwater levels through piezometer dipping and water quality sampling and testing, were ongoing. An education program for employees was conducted that

included fact sheets and information sessions on four vulnerable species that are either on the property or downstream of the operations.

Comalco

Comalco operates an electro metallurgical aluminium refinery at Bell Bay. A total of 629 people were employed including contractors. Production of aluminium was 166 000 tonnes. Capital expenditure was \$31 million. Major projects included:

- Upgrade in smelter capacity achieved through amperage creep (from 109 kA to 114 kA).
- Extension of natural gas to the casting shop, green carbon and rodding room. The carbon baking furnace was converted on arrival of natural gas to Tasmania.
- Upgrade of information technology infrastructure.
- Replacement of robot ingot stacker for the casting shop.

Impact Fertilisers

Production at the Hobart facility exceeded 180 000 tonnes of single superphosphate. A total of 105 people were employed together with an additional 20 contractors.

Development projects

The following capital projects were under way or completed during the year:

- Air hygiene system in plant.
- Effluent recycling pond and catchment system.
- New scrubber plant for plant emissions.
- Improved hoppers for dust control at wharf for unloading phosphate rocks.
- Increased storage areas in Hobart and regional areas.
- Out loading SSP dust control measures.

Tasmanian Electro Metallurgical Co Pty Ltd (TEMCO)

This company operates an electro-metallurgical smelter making ferro-alloys at Bell Bay. The company employs 275 people in production and administration, including contractors.

Production for the year comprised 133 000 tonnes of ferro-manganese, 116 000 tonnes of silicon-manganese and 214 000 tonnes of sinter. Sales totalled 134 000 tonnes of ferro-manganese, 123 000 tonnes of silicon-manganese and 377 000 tonnes of sinter.

Capital expenditure and major projects

A total of \$7.6 million was spent on cost reduction, process improvement and capital works. Major projects included:

- ❑ Tapping floor and slag fume collection upgrade for No. 5 Furnace (\$1.0 million).
- ❑ Additional day bins for No. 3 furnace (\$700,000).
- ❑ Replacement of No. 5 furnace transformers (\$600,000).
- ❑ MIMS upgrade (\$400,000).
- ❑ Additional day bins for No. 5 furnace (\$200,000).
- ❑ Energy recovery unit Bailey replacement (\$200,000).
- ❑ Metal launder fume collection for No. 1 and No. 2 furnaces (\$200,000).

Environmental works

The company is signatory to the Australian Minerals Industry Code for Environmental Management 2001 and maintains continued certification to ISO 14001.

- ❑ Special projects have reduced the incidence of furnace trips and reduced fugitive dust emissions. These have involved engineering controls to the flare stacks and improved procedures.
- ❑ Investigations of fume dam mud recycling and installation of a wet scrubber.
- ❑ Land Care of the site has been increased to reduce fugitive dust emissions and enhance the greening of the site.

The rare and endangered species project with the Royal Tasmanian Botanical Gardens is continuing to develop.

Zinifex Hobart Smelter

The Risdon zinc smelter, formerly owned by Pasmenco, became part of the operations of Zinifex Limited from April 2004.

The smelter uses the roast leach electrowin smelting process to produce more than 250 000 tonnes of zinc metal per year, most of which is premium zinc alloy product. Zinifex plans to increase production to 260 000 tonnes per year beyond 2005, with plans to increase EZDA production from 122 000 tonnes to 215 000 tonnes per year over the next five years.

The smelter also produces more than 420 000 tonnes of high quality sulphuric acid per year and approximately 110 000 tonnes per year of paragoethite, which is shipped to Port Pirie for treatment.

Following a plant trial in 2003, the proportion of Century zinc concentrate treated was increased from 10 to 35 per cent between April and June 2004. Process and plant design to convert to even higher levels is continuing with the objective of achieving 70 per cent Century feed blend in 2006.

Zinifex is expecting to spend around \$50 million during 2004 and 2005, which includes \$20 million for modifications necessary for Hobart to continuously process 70% of its concentrates from Century and \$1.9 million to increase EZDA capacity to 185 000 tonnes in 2005 as the first stage of the plan to increase production to 215 000 tonnes.

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

Mineral Resources Tasmania administers the Rehabilitation of Mining Lands Trust Fund to carry out rehabilitation on abandoned mine sites in Tasmania. The trust was created by the *Mineral Resources Development Act 1995*, with the State agreeing with the mining and quarrying industries to use a portion of mining royalty raised by the Act for rehabilitating Crown land affected by historic mining disturbance.

A total of \$281,000 was spent on this program during the year, with major programs at Balfour and St Helens.

Balfour

Erosion control and revegetation works were completed over approximately three hectares at Specimen Hill, to the immediate west of Balfour. Utilising an excavator, earthworks were undertaken to reposition recovered topsoil, regrade the area and establish appropriate drainage. A site supervisor was engaged and local labour was employed to spread jute matting and native seed. Granulated kelp is being trialled as a soil conditioner and fertiliser.

Expenditure totalled \$77,100.

St Helens

Erosion control and revegetation works were undertaken at the old tin mining area along Golden Fleece Creek. Deep erosion gullies were recontoured, while geotextile and rock-lined drains were established to help further stabilise these sites. The earthmoving contractor supplied an innovative three metre wide 'comb' which allowed cross-slope ripping to be undertaken in steep areas. Jute matting was spread and seed and fertiliser applied. A site supervisor was engaged and St Helens workers were employed and trained to ensure that the project had local ownership.

Expenditure totalled \$42,700.

Northeast alluvial tin mines

Revegetation works carried over from 2002/2003 were completed and maintenance works (weed control and fertilising) were undertaken.

Expenditure totalled \$19,200.

Storys Creek program

Revegetation of the jig tailings repository constructed in 2003 was completed in July at a cost of \$14,600.

Although sampling of Storys Creek and the South Esk River was carried out throughout the works programs, the steering committee determined that a monitoring program was necessary to evaluate the effects of the project. A three-year program has commenced, with preliminary results indicating a reduction in zinc levels in the creek.

Expenditure totalled \$7,900.

Rossarden

Although tailings at the Aberfoyle mine were rehabilitated by the Trust in 1997, revegetation success has been variable across the site due to metal contamination of the only available cover material. Soil conditioners derived from red mud, a waste product from alumina refining, have gained a reputation for absorbing metals. A trial has commenced to gather information on possible application at Rossarden and other sites.

It is anticipated that vegetation should survive if the tailings are treated with Terra B™, a Bauxsol™-derived soil amendment product designed specifically for the Rossarden application. Two trial areas have been selected, one where the tailings cover is contaminated with zinc, and the other where copper-rich material was formerly stored on surface. Virotec International Ltd was the contractor and obtained its raw material, stored red mud, from Comalco Aluminium Ltd at Bell Bay. Poa seedlings, a native grass, were subsequently planted in June.

Expenditure totalled \$11,800.

Shaft, safety and weed control

Construction of a galvanised steel grating, commenced in 2003, was completed to cover the Florence Shaft near Zeehan at a cost of \$30,100.

Work commenced on a shaft safety program at Mount Bischoff, which is extensively visited by the public and mineral collectors. A concrete cover for the Central Balfour shaft was also designed. Expenditure totalled \$14,500.

A pony trail passes close to the adits and a collapsed stope at Round Mount near Cethana. The adits were blocked and the collapse protected by a fence. Bridge logs were removed from Machinery Creek and limestone was used to ameliorate acid discharge. Expenditure totalled \$7,900.

At Oakleigh Creek steel grating was installed over a damaged adit barrier and a formerly unrecognised shaft. Expenditure totalled \$13,100.

An amount of \$4,400 was spent on a trailer and four-wheel motorbike maintenance to support Trust programs.

Gorse spraying was again undertaken at the remote Queensbury mine near Zeehan. The Parks and Wildlife Service continue to project manage and conduct this work. Weed removal was carried out at the Zeehan Queen mine, a site of former Trust activity. The Zeehan Landcare Group undertook this particular project. Expenditure totalled \$6,900.

Quarry rehabilitation

A steep, disused gravel pit at The Badgers, near Sheffield, is visible from the town. A rehabilitation trial was conducted in 2003 which demonstrated the stability of a bench on this site. Two additional benches were excavated to provide foundations for vegetation screens on nearby sections.

Areas were ripped and drainage was improved. Steep slopes were protected with jute matting before seed was applied. Earthworks were carried out by Treloar Transport, with Conservation Volunteers Australia being engaged to carry out the seed application.

Expenditure totalled \$23,000.

Trust Fund reporting

The steering committee approved a project to publicise Trust programs. The initial phase is digital capture of technical reports describing investigations, plans and results of programs. The reports will be available by document search on the MRT website. Expenditure totalled \$6,400.

Mt Bischoff remediation

A Commonwealth grant from RiverWorks Tasmania of \$230,000 has been administered by MRT from 2002 to 2004. Investigations into the environmental impacts of acid drainage were conducted and an initial phase of rehabilitation work was carried out. An anoxic limestone diversion drain was constructed from Websters Creek to North Valley above the Waratah River. The works in question reflected Trust Fund objectives and the steering committee approved extra funding to cover a budget shortfall of \$9,600.