

Mineral Resources Tasmania

Annual Review

2010/2011



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MINERAL RESOURCES TASMANIA

Mineral Resources Tasmania (MRT) is a Division of the Department of Infrastructure, Energy and Resources (DIER).

MRT is Tasmania's corporate entity for geoscientific data, information and knowledge, and consists of a multi-tasking group of people with a wide range of specialist experience.

The 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*.

Mission

- To contribute to the economic development of Tasmania by providing the necessary geoscientific information and services to foster mineral resource and infrastructure development and responsible land management 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 geoscientific information for integration 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 on Tasmania's geohazards.
- Regulation of mineral and petroleum exploration and development in Tasmania, and the promotion of vacant areas available for onshore exploration.
- Setting and monitoring of standards for both the performance of exploration activities and the technical reporting of exploration records and case histories.
- Environmental appraisal, monitoring and management of mining heritage and land access issues.
- Issue of legal titles for 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.

Management of Mineral Resources Tasmania (as at 30 June 2011)

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Mineral Resources Tasmania Summary of Activities, 2010/2011

Major initiatives

The major initiatives and issues affecting MRT in 2010/2011 included:

- Completing the compilation of all geological mapping undertaken in northeast Tasmania and King Island as part of the *TasExplore* initiative, completion and publication of most of the resulting geological reports on northeast Tasmania, and completion of a first pass 3D geological model of northeast Tasmania.
- The return of private investment in mineral exploration to pre-Global Financial Crisis levels with consequent pressure on tenement management and geological staff, exacerbated in the latter case by the retirement of a number of staff members.
- Acquisition of aeromagnetic data off the east coast of Tasmania as part of a joint National Geoscience Agreement project with Geoscience Australia.
- Enhancing the provision of geoscientific data through the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- Undertaking a series of promotional activities to further encourage the continuing upsurge in mineral exploration in Tasmania, albeit on a reduced scale.
- Providing resources for environmental monitoring of exploration and mining tenements, and for the inspection of mines and quarries.
- Continuation of the royalty audit program to ensure tenement holders are paying in accordance with legislation.

The major issues and initiatives for 2011/2012 are to:

- Commence work under a new government initiative to increase the attractiveness of western Tasmania for mineral exploration, as well as upgrading the 3D geological model of the region.
- Participate in the development of a three-dimensional geological model of southeast Australia (SEA-3D) by a project team from Geoscience Australia, GeoScience Victoria and MRT working under a joint National Geoscience Agreement.
- Continue updating data for the Tasmanian Information on Geoscience and Exploration Resources (TIGER) system.
- Undertake a series of promotional activities to encourage mineral exploration in Tasmania, including the promotion of the three-dimensional model of geological structure and major mineralising pathways of Tasmania.
- Continue to produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- Continue to provide resources for environmental monitoring of exploration and mineral tenements, and for inspection of mines and quarries.

- Continue the rehabilitation of abandoned mining sites in Tasmania.
- Continue the royalty audit program.

Achievements against strategies identified for 2010/2011

New initiatives to stimulate mineral exploration in Tasmania

Mineral exploration expenditure continued to grow strongly in 2010/2011. According to the Australian Bureau of Statistics mineral exploration in Tasmania for the 2010/2011 financial year was \$37.3 million, up 80% on the \$20.7 million for the 2009/2010 year. Over this period, Tasmania's share of national expenditure increased from 0.93% to 1.26%, the highest rate of increase of any jurisdiction. Spending on exploration for new deposits increased from \$13.5 million to \$17 million, while exploration on existing deposits increased substantially from \$7.2 million to \$20.3 million for the 2010/2011 year.

The proportion of spending on the search for new deposits was 45.6%, down on the 65.2% of 2009/2010, but still well above the national average of 35.2%. Significantly, the recovery in exploration activity has been so marked that expenditure now exceeds pre-GFC levels, a result likely to lead to the new discoveries needed to sustain the Tasmanian mining industry in the longer term.

Promotion of mineral and petroleum potential

The Tasmanian Government provided \$67,800 in 2010/2011 to actively market mineral exploration and development opportunities in Tasmania, both as a part of the *Team Australia* marketing group and as a separate delegation.

Because of financial constraints, no visits were made to Canada or London during the year although senior DIER staff met with Chinese companies and attended promotional events in China.

Promotional missions and functions were also conducted in Perth, Sydney and Melbourne. These visits continued to provide strong positive feedback on the mineral potential, infrastructure and business climate in Tasmania, as well as on the geoscientific programs conducted by MRT.

Presentations were made at the Tasmanian Minerals Conference at Launceston in May, and to the Association of Mineral Exploration Companies Convention in Perth in June. A poster display and presentation were given at the Mining 2010 Convention in Brisbane in October, while regular two-monthly updates on exploration progress in Tasmania were provided to the international Society of Economic Geologists newsletter.

These promotions have been successful and continue to play an important role in attracting new mineral exploration companies to Tasmania, as well as stimulating interest in potential new mining and processing projects and in existing mining operations that were available for investment.

Collection, integration, interpretation, publication and presentation of data

Verification, upgrading and loading of information into the TIGER system continued. The TIGER system has a single geoscience data model with user interfaces for geohazards, geophysics, drilling, mineral deposits, geoscience maps, samples and geochemistry. Other information available includes geology, mineral tenements and documents held by MRT, and general information for MRT and DIER clients. As information is added to the MRT website clients are encouraged to access this information via the website in a self-service manner rather than placing a formal order with MRT, which both slows the supply of information and requires MRT staff resources to fulfil.

The recorded volume of downloads from the MRT website totalled 58 459 gigabytes, compared with a total of 9796 gigabytes in the previous year. Approximately 43 728 gigabytes of this resulted from downloads to one site in the month of January. After discounting this exception, the total download volume of 14 731 gigabytes is substantially higher than in the previous year.

This heightened level of downloads from the MRT website is attributed to the increase in the nature and volume of information available, which allows clients to download their required information. The rapidly increasing level of mineral exploration activity following the period of financial constraint can be expected to have also had some effect.

Through the Government Geoscience Information Committee, MRT has been a major participant in the AuScope GRID project and is now using WFS to deliver mineral occurrence data (using Earth ResourceML), and drill hole location data (using GeoSciML).

The conversion of MRT's 1:250 000 and 1:500 000 scale digital geology maps from the AGD66 datum to the GDA94 datum has been completed. The conversion of the 1:25 000 scale digital geology maps is progressing well, with over 200 of the 207 maps already converted.

Work on the *TasExplore* project in northern Tasmania continued during the year. The geology of five map tiles in northeast Tasmania was amended during the year with a total of 37 map tiles being amended as a direct result of the *TasExplore* project. Ten reports and products have now been completed for this project and three others are in an advanced state of preparation.

The focus of the *TasExplore* work in northeast Tasmania was on mapping geological subdivisions within the Mathinna Supergroup, the main host for gold deposits in the region. The recognition of seven formations in the area west of Scottsdale has enabled better definition of the controls on gold localisation and upgrading of the three-dimensional geological model for this area. Detailed 3D models were constructed for the linear zone of gold deposits extending from Alberton to Mathinna and for the Scamander area.

On King Island, the Stokes geological map sheet has been compiled while geological mapping of the Pearshape sheet is almost complete.

Work on the interpretation of the geochemistry and genesis of the Savage River iron deposit has been completed

and a report is in preparation. This work has important implications for future exploration of the Arthur Lineament of northwest Tasmania.

Under a joint National Geoscience Agreement project with Geoscience Australia, approximately 32 000 line kilometres of aeromagnetic data have been acquired from the continental shelf off the east coast of Tasmania over an area extending from Musselroe Point to 100 kilometres south of Tasman Island. These data will be used as input in the development of a revised three-dimensional geological model of Tasmania.

A regional landslide mapping project, the Tasmanian Landslide Map Series, is the main geohazard related activity undertaken by MRT, with maps of the Launceston, Hobart, Glenorchy and North West Coast areas being completed in previous years. The northern Tamar Valley landslide mapping project, covering the area between the mouth of the River Tamar and just north of Launceston, is making good progress, and publication is scheduled for this calendar year. These landslide maps are assisting local government and geotechnical practitioners to make informed decisions on planning and development issues, especially given the pressure for development of marginal lands around our cities.

MRT provided assistance with the development of the landslide component of the draft Statewide Codes produced by the Tasmanian Planning Commission as part of a major planning review in Tasmania. Work has commenced on the initial phases of a project to produce a Statewide Landslide Planning Overlay, with computer programming code being developed to allow susceptibility modelling of very large spatial datasets to create the overlay. Work is also underway on advanced debris flow modelling of Mount Wellington.

The TIGER Geohazards (landslide) database, which forms a critical data foundation for the landslide mapping project, continues to be developed. There are currently about 2500 records in the database, including details of damage caused by landslides, and more records are added as each landslide map area is completed. This database has recently been web-enabled to allow greater access to our information by the community.

MRT has historically monitored a number of active landslides in Tasmania, with the School Creek landslide at Tarooma and the Lawrence Vale landslides at South Launceston currently being monitored. The inclinometers on the two landslides at South Launceston have recorded no movement since they were installed in 2005 but the near real-time landslide monitoring facility at Tarooma continues to record intermittent movement. Above average rainfalls have occurred in 2009/2010 and 2010/2011, and analysis of the data collected from Tarooma shows strong relationships between rainfall, the consequent rise in groundwater pressure and landslide movement, allowing for an improved understanding of landslide performance that in turns leads to more accurate hazard and risk analyses, and risk management strategies.

MRT is also involved with a major risk management study, managed by the Kingborough Council, of the Tarooma

landslide complex, with funding from the Natural Disaster Mitigation Programme being used to compile information on infrastructure and damage records into a single repository.

Setting and monitoring of standards for exploration activities

MRT is responsible for ensuring that all exploration activity in Tasmania achieves the highest environmental standards and complies with the *Mineral Resources Development Act 1995* and the requirements of other legislation which protects, for example, threatened species and cultural heritage.

The fourth edition of the *Mineral Exploration Code of Practice* outlines the current requirements, the approvals process, and the controls and monitoring procedures that MRT has in place. Work on compiling a fifth edition of the Code is continuing.

During the year 91 exploration work programs were submitted to MRT, compared with 74 in the previous year. Seventy-nine of these programs were approved, including 37 which were in reserves derived from the Regional Forest Agreement (RFA) and required assessment by the Mineral Exploration Working Group.

To comply with the RFA, MRT has developed a system to spatially record exploration activity and attributes that chart the process of approval of individual work programs. All work programs, whether on Crown land, State Forest or private property, are entered into this system to give a complete record of all the environmental information relating to exploration.

This system provides an integrated textual and spatial environment to ensure that compliance auditing of the exploration work approval system is adhered to and that derived statistics reflect the requirements of the RFA and the recommendations of the Resource Planning and Development Commission.

Mining leases

The *Mineral Resources Development Act 1995* provides for the State to grant titles for the extraction of minerals from mines and quarries. Titles are issued for larger scale operations with appropriate rehabilitation bonds and conditions. Shorter terms are preferred for small-scale remote operations to provide for regular environmental review.

At the end of 2010/2011 there were 567 granted mining leases with 32 leases in the application stage. During the year applications were received for 23 new leases and 36 lease renewals. There are currently 21 applications yet to be granted and 110 renewals being processed. The number of pending renewals is a significant reduction compared to the same time last year.

Mining Tribunal

The Mining Tribunal dealt with matters affecting licences and leases held by Great South Land Minerals Ltd, Stonehenge Metals Ltd, B3 (Bell Bay Bluestone) Pty Ltd, Merdon Exploration Pty Ltd, M E Phelan and Cresswell's Transport Pty Ltd. Two matters are still to be resolved.

Protection of strategic extractive resources

It is imperative that planning processes include the consideration of strategic extractive resources. There has been an increase in cases where planning approvals that would potentially sterilise strategic extractive resources have been made. MRT continues to take an active role in guiding planning decisions to ensure the protection of these resources. This includes adopting a strategic approach to development of a planning overlay identifying strategic extractive resources and their associated buffers. Work on this is progressing.

Rehabilitation of Mining Lands Trust Fund

The main activities during 2010/2011 were mine shaft safety at a number of sites and remediation of historic tin mine tailings at Royal George. Mine shafts at Lefroy, Scamander/St Helens, Beulah, Rossarden, Mt Nicholas and Zeehan were either covered or back-filled to provide for public safety. Remediation works continued at Royal George with further application of lime and fertiliser to tailings, installation of drainage control structures, cultivation and vegetation work. Follow-up work, including revegetation and weed management, on rehabilitation sites at Balfour and gravel pits in the Dip Range Regional Reserve, was also undertaken. Approximately \$189,000 was spent on Trust Fund projects during 2010/2011.

Royalty assessment

MRT is responsible for the collection of mineral royalties from Crown land tenements. Royalty is a payment to the community for the purchase of non-renewable resources.

Mineral royalty revenues for 2010/2011 were \$45.3 million, an improvement over the \$34.7 million collected in the previous financial year which was still impacted by the global financial crisis and the resulting decline in commodity prices. The 2010/2011 receipts represent the highest royalty revenue per annum collected to date, the previous high being the \$41.4 million collected for 2007/2008.

Mineral royalty revenue is expected to remain at around the 2010/2011 level for the coming years based on prices remaining strong with continued demand for commodities from the developing Asian markets, despite the high value of the Australian dollar. An improvement in prices and the recommissioning of the Auebury nickel mine would impact positively on expected revenues.

Financial Performance

The 2010/2011 consolidated fund appropriation to Mineral Resources Tasmania was \$6.346 million. This funding consisted of:

- \$4.61 million for salaries for 53.5 full-time-equivalent staff;
- \$1.611 million for operating expenditure, including rent;
- \$0.125 million for the promotion of Tasmanian mineral opportunities.

In 2010/2011 MRT was funded for the four-year West Coast Geosciences project. This project provided \$0.125 for promotional activities each year plus \$1.5 million from 2011/2012 to undertake further collection of geoscientific data to enhance the existing TIGER system and stimulate mineral exploration in the region.

MRT's operating budget remains tight, with further pressure expected in coming years due to the savings required in the Tasmanian State budget following a decline in the State's finances.

Commonwealth Natural Disaster Mitigation Programme funds of \$0.93 million were carried forward to continue the Tasmanian Landslide Mapping Program.

Outputs — Application of funds, 2010/2011

Tasmanian government agencies are funded on an outputs basis, with these outputs representing the goods and services delivered 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 overheads associated with head office and carry forward funds that are loaded into outputs.

MRT has two outputs:

| Output | \$'000 |
|---|--------------|
| 1. Minerals exploration and land management | 3,661 |
| 2. Tenement management of the exploration and minerals industry | 3,298 |
| Total | 6,959 |

Descriptions of Outputs and Outcomes, 2010/2011

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;
- the 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.

The desired outcome is 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;
- the provision of advice to all levels of government and the public on land management issues;
- the administration of mining legislation, including the issue of legal titles for mineral tenements;
- the collation and recording of statistics relating to mining production and exploration; and
- the audit and monitoring of fee, rental and royalty collection.

The desired outcome is effective and efficient tenement management of the exploration and minerals industry.

Revenue from fees and charges

Mineral royalties totalling \$45.3 million were collected during the 2010/2011 financial year, continuing the trend of increasing royalty revenues over the past few years with a strengthening of commodity prices through continuing strong demand for resources. Collections for the prior two years were \$34.7 million and \$27.8 million.

Royalty revenues for 2011/2012 are budgeted at \$47.1 million. This estimate represents an expectation that commodity prices, exchange rates and production levels will continue at the levels experienced at the end of calendar year 2011.

The operations of individual mines are detailed later in this review.

Mineral Resources Tasmania also collects rents and fees from mineral lands, which are forwarded directly to consolidated revenue. Rents and fees from offshore petroleum tenements will drop in the current year as administration of these will now be undertaken by a newly created Commonwealth body.

| | Target 10/11 | Actual 10/11 | Target 11/12 |
|--|-----------------|-----------------|-----------------|
| Royalties (\$,000) | 40,710 | 45,324 | 47,117 |
| Rents and Fees (\$,000) | 1,560 | 1,269 | 1,560 |
| Rents and Fees — Petroleum (net of administration) (\$,000) | 203 | 504 | 86 |
| Sales of Maps and Publications (\$,000) | 23 | 15 | 23 |

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.

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 on the profit of a mine. Royalty on the recovery of non-metallic minerals on Crown leases is set on a 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 only requires mining companies to pay a lesser fixed minimum royalty in times of no profitability, but ramps up to a maximum of 5% of net sales as profits increase.

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.

From 1 January 2012 royalty rates will change. The ad valorem rate for net sales will be 1.9% with the cap at 5.35%. The base non-metallic rate per tonne will increase from \$0.60 to \$0.66.

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.

MRT conducts a royalty audit program to ensure tenement holders are paying in accordance with the legislation.

Mineral Resources Tasmania — Review of Branch Activities, 2010/2011

Metallic Minerals and Geochemistry

During the year the Metallic Minerals and Geochemistry Branch was responsible for the provision of information on and promotion of the metallic mineral endowment of Tasmania, and provision of new geoscientific information in areas relevant to mineral exploration. The branch is also responsible for providing geochemical, petrological and mineralogical services for clients within and outside DIER. During the year responsibility for maintaining the Mornington core library was passed to the Royalty, Finance and Administration Branch.

The structural geologist, who played a key role in the *TasExplore* mapping project, retired at the end of 2010 and is yet to be replaced. This results in a key shortfall in MRT's ability to be competitive in the growing field of three-dimensional geology. An additional impact is the requirement for branch staff to place a higher proportion of work time into tenement administration, a situation exacerbated by the current record levels of mineral exploration activity in Tasmania.

Geoscientific data generation

The *TasExplore* project has resulted in a major advance in the understanding of the geology of the Mathinna Supergroup, the main gold-bearing unit in northeastern Tasmania. The discovery of several new fossil localities has enabled identification of a precisely dated horizon in the Scottsdale and Golden Ridge areas. Seven formations (geological subdivisions) have been recognised west of Scottsdale and this has enabled better definition of the controls on gold localisation, including clustering of gold deposits along contacts between different geological formations, and better identification of gold-bearing structures. The geology of five map tiles in northeast Tasmania (Ben Nevis, Giblyn, Blessington, Nunamara and Mathinna) was amended during the year and compilations completed, completing the *TasExplore* (TIGER Initiative) project mapping for the region. Ten reports and products have now been completed for the project and three others are in an advanced state of preparation. A total of 37 map tiles in northeast Tasmania were amended as a direct result of the *TasExplore* project.

The three-dimensional geological model has been upgraded for this area, as has the detailed model constructed for the linear zone of gold deposits extending from Alberton to Mathinna, showing detailed structural controls. A model has been constructed for the Scamander area that shows the relationship between the form of the underlying granite, fault locations, and siting of tin, tungsten and base metal deposits in the area.

In carrying out this work, MRT is developing the skills to enable 3-D modelling to contemporary standards to be undertaken in-house. Training of geological staff in the

GoCAD software package was further advanced during the year.

On King Island, the Stokes map sheet has been compiled and mapping of the Pearshape sheet is almost complete. This will complete the geological coverage of the southern half of King Island.

Work on the interpretation of the geochemistry and genesis of the Savage River iron deposit has been completed and a report is in preparation. This work has important implications for future exploration of the Arthur Lineament of northwest Tasmania.

A thermal infra-red scanner was successfully added to the hyperspectral infra-red core logging device (HyLogger) by CSIRO personnel in June. The instrument is funded by the Commonwealth under the National Critical Research Infrastructure (NCRIS) Auscope Virtual Core Library Project. The addition will significantly increase the range of minerals that may be identified. Following the resignation of the technician, the HyLogger only operated on a limited basis during the year, with 1355 metres of core from five holes scanned and results from two holes processed to publication quality. A new operator will be recruited on a part-time basis in early 2011/2012.

Database development

A significant part of the work of the branch for the year continued to be the testing of database structures for the TIGER System and verification and capture of data for incorporation in the system.

Branch members continued to contribute to the development of a national data model for mineral deposits and occurrences.

Core library

The high level of usage of the core library continued, with 73 drill core inspection days, amounting to 273 person visitation days to mid October. This includes 96 visitation days, consisting of four days on which 24 students from the University of Tasmania were being trained in core logging.

Approximately nine kilometres of core from five companies was added to the library collection during that time.

Remaining storage is very limited and the installation of new racking in the half of the new area completed in 2005/2006 remains an urgent priority.

Mineral exploration and other promotional activities

The Tasmanian Government provided \$67,800 in 2010/2011 to actively market mineral exploration and development opportunities in Tasmania, both as a part of the *Team Australia* marketing group and as a separate

delegation. Because of financial restraints, no visits were made to Canada or London during the year.

Two senior DIER staff met with Chinese companies in Shanghai and Chinese provincial areas in August, and were joined by the Minister for Energy and Resources for a week at the Shanghai World Expo. Two DIER personnel attended the Australia-China Mining Investment Seminar in Beijing and China Mining 2010 Congress in Tianjin in November, as well as meeting with Chinese companies in Beijing and Hong Kong.

Presentations were made at the Tasmanian Minerals Conference at Launceston in May, and to the Association of Mineral Exploration Companies Convention in Perth in June. A poster display and presentation were given at the Mining 2010 Convention in Brisbane in October.

Regular two-monthly updates on exploration progress in Tasmania were provided to the international Society of Economic Geologists newsletter as part of a global review of mineral exploration.

Promotional missions and functions were conducted in Perth, Sydney and Melbourne by officials from DIER. During these visits, there was continued strong positive feedback on the mineral potential, infrastructure and business climate in Tasmania, as well as on the geoscientific programs conducted by MRT.

These promotions have been successful and continue to play an important role in attracting new mineral exploration companies to Tasmania, as well as stimulating interest in potential new mining and processing projects and in existing mining operations that were available for investment.

Petrology and lapidary laboratories

The lapidary and petrology laboratories provided a total of \$30,586 worth of analyses and services to both DIER (\$14,600) and external clients (\$15,986). Most of this external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 185 standard thin sections and six other sections on an as-needed basis, valued at \$4,865.

The technical officer for petrological services processed 430 samples by X-ray diffraction, including 203 quantitative dust analyses. A further 18 soil and sizing tests and 33 optical asbestos identifications were conducted, for a total of 481 samples processed valued at \$25,721. Some of the technical officer's time was spent preparing samples for, and operating, the XRF for the geochemistry section, assisting with the HyLogger, and database work.

A total of 347 external samples were received for investigation, mostly by X-ray diffraction analysis. These samples included 223 for occupational health clients, 17 soils, 25 construction materials, four forensic samples, 24 samples for the national Auscope Project, and 50 other samples. This external work came from a wide range of external sources, including other government departments, the University of Tasmania, mining, mineral processing and mineral exploration companies, environmental and

occupational health consultants, and the general public and private businesses.

Samples studied included geological materials (construction materials, mineral concentrates, ore samples, rocks, soils, sands and clays), and anthropogenic materials (including forensic samples, concretes, asbestos sheeting, industrial materials, dusts, etc). Forensic studies continued with work for Police Tasmania, including some field work on a murder investigation.

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 ongoing. A new lapping machine and photomicrography system was purchased and installed.

The petrologist curates the rock store and associated SAMPLES database, and helps with other related databases. A total of 467 new samples were entered and 2059 sample revised.

Curatorial

Curatorial work has included some cataloguing, sorting, compiling and storage of rocks and thin sections, and general supervision of the rock store. The old rock collection and storage databases are still being digitised and migrated into the TIGER system. The oldest samples are gradually being boxed and palletised to make space for new samples, with over 11,000 done to date, as the compactus nears capacity. The mineralogist/petrologist assists with storage and control of some radioactive, asbestos-bearing and other dangerous geological substances.

Promotions

The mineralogist/petrologist liaises with lapidary clubs and companies, the Tasmanian Minerals Council and the general public with lapidary and gem and mineral collecting matters. MRT was represented at gem and mineral shows in Hobart, Devonport and Zeehan, and the National Mineralogical Symposium in Melbourne, plus the world's largest gem and mineral show in Tucson, Arizona. Over \$3350 of MRT books, maps and fossicking licences were sold at these shows.

About 143 public and commercial enquiries were handled on all manner of mineral, mining, gem, soil and rock-related matters, particularly in regard to gem, rock and mineral locations and identification, occupational health issues, and mine locations. Geology/mineralogy talks were given at several schools, and mineralogical and curatorial advice was provided to the Tasmanian Museum and Art Gallery when required. A forensic geology talk was given to the Geological Society of Australia in Hobart, a talk on new mine and mineral potential was given to the National Mineralogical Symposium (Melbourne), and a talk on Tasmanian minerals was given to the Australian Earth Sciences Symposium in Canberra.

Geochemical laboratory

The laboratory was staffed for 2010/2011 by a senior geochemist and three technical officers (two full time and one part time). The full-time technical officers were also involved in other duties, including assisting with operating

the HyLogger, data entry into TIGER and helping with the day-to-day work of the core library. The senior geochemist was also involved in geological projects, TIGER databases, safety issues and tenement administration.

The laboratory generates the chemical/geochemical data necessary to maintain MRT's databases and geological mapping. Activities during the 2010/2011 financial year included:

- Maintaining a safe working environment for the geochemical and the crushing laboratories, in compliance with the Australian OH & S standards.
- Bi-annual medical examination for technical officers (general health, hearing, blood tests).
- Registration of 388 rock samples resulting in 16,028 individual determinations with a value of around \$99,000.
- Further certified standards were purchased for the new XRF unit. The Leco induction furnace was maintained with difficulty during the year. Five quotations were received for a replacement unit.

The geochemical laboratories are continuously improving in terms of OH & S issues, analytical procedures and equipment, making them safer and more productive workplaces.

Other activities

- Three staff members are on safety committees, including as Chair.

- A branch member was trained for the role of representing Tasmania on the Government Geologists Information Policy Advisory Committee.
- A branch member is on the Operations Committee for the National Virtual Core Library Project and on a national Ad-Hoc Committee on Reporting Resources.
- Site visits were made to various exploration project sites and mines during the year as a part of reviewing industry progress.
- 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. A submission was prepared on expenditure commitments on exploration tenements in the light of the global economic crisis.
- Many requests for information on geology, mineral resources, minerals and related matters were received and dealt with promptly.
- The science planning and advisory board meetings of the Centre of Excellence in Ore Deposits at the University of Tasmania (CODES) were attended.
- The Chief Government Geologists Committee meeting was attended in Melbourne.

Environment, Land Management and Industrial Minerals

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

Environmental management

The number of exploration work programs submitted for approval has increased to ninety-one from seventy-four in 2009/2010. This is similar to the numbers seen in the first minerals boom.

Compliance auditing

In 1998/1999 MRT developed a GIS-based system to record and monitor the approval process for exploration programs. A clause in the Regional Forest Agreement (RFA) states that MRT must audit compliance with the *Mineral Exploration Code of Practice*.

The auditing system (TEAMS II) allows the detailed recording of all exploration activities across Tasmania's many types of land tenure. The life of the exploration activity is tracked from proposal through approval, works completed and rehabilitation. The following tables of statistics are produced as standard reports from the system. As the system records exploration details and has to account for the changes in land tenure, it is not possible to directly compare this year's statistics with those in previous years.

Ninety-one work programs were submitted to MRT during the year compared with seventy-four in 2009/2010. Of those received, seventy-nine were approved, two were withdrawn, eight have since been approved and two are pending. Thirty-seven work programs were within CAR Reserves and required comment from the Mineral Exploration Working Group.

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

Table 1: Activities approved

| Activity | CAR Reserve System | High Quality Wilderness | State Forest | Crown Land | Private Property | HEC Land |
|------------------|--------------------|-------------------------|--------------|------------|------------------|----------|
| Drill site | 168 | 72 | 62 | 19 | 195 | 0 |
| Helipad site | 5 | 2 | 0 | 0 | 0 | 0 |
| Bulk sample site | 0 | 0 | 36 | 1 | 2 | 0 |
| Costean (km) | 0.34 | 0.18 | 0.55 | 0 | 0.14 | 0 |
| Grid (km) | 131.59 | 91.53 | 42.81 | 26.22 | 6.08 | 3.25 |
| Track (km) | 2.25 | 3.06 | 1.90 | 0.43 | 0.00 | 1.02 |

A total of 5.61 hectares of on-ground disturbance was recorded through the year. Table 2 shows the breakdown of the disturbance for the different land tenures and activity types.

Table 2: Area of disturbance (ha)

| Activity (ha) | CAR Reserve System | High Quality Wilderness | State Forest | Crown Land | Private Property | HEC Land |
|------------------|--------------------|-------------------------|--------------|------------|------------------|----------|
| Drill site | 1.13 | 0.68 | 0.26 | 0.06 | 0.96 | 0 |
| Track | 1 | 0.93 | 0.94 | 0.05 | 0 | 0.20 |
| Costean | 0.14 | 0.07 | 0.19 | 0 | 0.06 | 0 |
| Helipad site | 0.20 | 0.08 | 0 | 0 | 0 | 0 |
| Bulk sample site | 0 | 0 | 0.35 | 0.01 | 0.02 | 0 |
| Camp site | 0.03 | 0.03 | 0 | 0 | 0 | 0 |

Of the 5.61 hectares of disturbance, 1.45 hectares were rehabilitated during the year, with the remainder to be rehabilitated through the life of the licences. It is a licence condition that all earth-moving disturbances will be rehabilitated on or before the expiry of the licence and prior to the return of the security deposit.

In Table 3 the area that has been rehabilitated is shown for each activity and land tenure category, while the area rehabilitated against the disturbances is shown in Table 4. Approximately 26% of the area disturbed in the reporting period, for all land categories, has been rehabilitated.

Table 3: Area rehabilitated (ha)

| Activity (ha) | CAR Reserve System | High Quality Wilderness | State Forest | Crown Land | Private Property | HEC Land |
|------------------|--------------------|-------------------------|--------------|------------|------------------|----------|
| Drill site | 0.05 | 0.04 | 0.02 | 0.01 | 0.93 | 0 |
| Costean | 0 | 0 | 0.07 | 0 | 0 | 0 |
| Helipad site | 0.20 | 0.08 | 0 | 0 | 0 | 0 |
| Bulk sample site | 0 | 0 | 0.01 | 0.01 | 0 | 0 |
| Camp site | 0.01 | 0.01 | 0 | 0 | 0 | 0 |

Table 4 presents the running totals for the last four years of the area disturbed and area rehabilitated.

Table 4: Disturbance and rehabilitation over four years

| Year | CAR Reserve System | State Forest | Crown Land | Private Property | HEC Land | Total |
|--------------------|--------------------|--------------|------------|------------------|----------|-------|
| Disturbance (ha) | | | | | | |
| 2007/2008 | 6.21 | 3.95 | 0.05 | 0.49 | 0.03 | 10.74 |
| 2008/2009 | 3.92 | 2.20 | 0.62 | 2.09 | 0.00 | 8.84 |
| 2009/2010 | 6.85 | 3.18 | 0.48 | 1.34 | 0.30 | 12.15 |
| 2010/2011 | 2.50 | 1.76 | 0.12 | 1.03 | 0.20 | 5.61 |
| Rehabilitated (ha) | | | | | | |
| 2007/2008 | 1.72 | 1.35 | 0.05 | 0.46 | 0.03 | 3.62 |
| 2008/2009 | 1.93 | 1.53 | 0.59 | 0.31 | 0.00 | 4.36 |
| 2009/2010 | 2.04 | 1.81 | 0.12 | 0.54 | 0.17 | 4.66 |
| 2010/2011 | 0.27 | 0.10 | 0.02 | 0.93 | 0 | 1.31 |

Approximately 37% of overall disturbance has been rehabilitated. Disturbances are no longer counted as such if no further rehabilitation work is required of the explorer, or if the area is taken up as a mining lease.

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

Table 5: Disturbance and rehabilitation, High Quality Wilderness areas

| Year | Disturbance (ha) | Rehabilitated (ha) | Percentage of overall disturbance rehabilitated |
|-----------|------------------|--------------------|---|
| 2007/2008 | 4.62 | 0.73 | 16% |
| 2008/2009 | 2.19 | 1.37 | 62% |
| 2009/2010 | 4.66 | 1.70 | 37% |
| 2010/2011 | 1.79 | 0.14 | 8% |

Note: High Quality Wilderness is an overlay on top of the CAR Reserve System and State Forest so is not added into the total area of disturbance to avoid double counting.

Codes of Practice

The fourth edition of the *Mineral Exploration Code of Practice* is a code under the *Mineral Resources Development Act 1995*. This code has been reviewed as specified in the Resource Planning and Development Commission Inquiry into areas to be reserved under the Tasmania–Commonwealth Regional Forest Agreement. The draft will be released for comment in 2011/2012.

The second edition of the *Quarry Code of Practice* is a code under the *Mineral Resources Development Act 1995* and is currently under review.

Mining Leases

MRT is responsible for the assessment, inspection, regulation and administration of all mining leases in Tasmania. A mining lease is required for mining and extractive activities in the State, including quarrying. Each mining lease has site-specific conditions and a security deposit appropriate to the size and nature of the operation.

Conditions are set to ensure the highest standards are met in relation to environmental, planning, nuisance and heritage matters, and compliance with the *Mineral Resources Development Act 1995* and other relevant legislation and guidelines, including the *Quarry Code of Practice*. MRT inspectors work closely with other agencies such as the Environment Protection Agency (EPA), Aboriginal Heritage Tasmania, local government and land managers.

At the end of the reporting period there were approximately 590 mining leases in force statewide on a variety of land tenures such as Crown land, State Forest and private land. During the same period, MRT had a staff of one Senior Inspector and 2.5 full-time equivalent inspectors for liaison and regulation.

In total 282 mining lease inspections were carried out for the year. Of this, 30 were for new mining lease applications, 124 for renewals, transfers and surrenders, 121 for routine follow-up, four complaints and three potential illegal mining cases. The number of long-standing lease renewals has been reduced from approximately 200 at the end of 2009 to 115 by the end of 2011.

Submissions, representations, appeals and/or advice in relation to town planning and quarries were made to the George Town, Meander Valley, Southern Midlands, Derwent Valley and Devonport councils, and the EPA. Town planning matters such as land stability, zoning and residential developments near extractive industries are important constraints for extractive operations.

The Scotia Mine Rehabilitation Project commenced in the reporting period, funded by the Van Diemen Mines forfeited security deposit. The Decommission and Rehabilitation Plan is being prepared prior to seeking State and federal environmental approvals to undertake the rehabilitation works. Some minor emergency repair work was also undertaken in June 2011 around the tailings facility to remediate gully erosion on the dam walls.

Hydrocarbons

The Thylacine and Yolla gasfields, which are both in Tasmanian waters, continue to produce gas which is piped to Victoria. Two petroleum exploration wells were drilled in Tasmanian offshore waters: Silvereeye-1 and Craigow-1, both in the Bass Basin. Neither well encountered commercial hydrocarbons. Four offshore seismic surveys and one seabed sampling survey were undertaken during the year.

Engineering Geology

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

Land instability

Land instability is a significant hazard in Tasmania, with many homes having been destroyed over the years and significant damage caused to infrastructure. By studying and understanding the landslide hazard it is possible to minimise or avoid the effects of land instability. MRT is actively addressing this hazard through landslide susceptibility zoning and the monitoring of specific landslides.

Work is advancing on a set of landslide susceptibility maps along the northern Tamar Valley. This area has a reputation for landslide activity and the new mapping will eventually supersede the existing Tamar Advisory Series maps that have been in circulation for over twenty years. This project was undertaken in partnership with local councils and with funding assistance from the Australian and Tasmanian government's Natural Disaster Mitigation Programme (NDMP).

Work has begun on a Landslide Planning Overlay to produce planning advice for the entire State. The process involves combining the results of our detailed mapping with other data using less rigorous proxies to produce a single layer. This work has also received funding by the Natural Disaster Mitigation Programme (NDMP) and is being run in conjunction with a Standard Hazards Statements reference group run out of the Department of Premier and Cabinet. As part of the NDMP project MRT, in conjunction with other State and local government organisations, acquired LiDAR and Orthoimagery of the Wellington Range area. This information will assist the revision of the geomorphology mapping and debris flow modelling in the area.

MRT assisted the Australian Geomechanics Society to organise a one-day national roadshow on Landslide Risk Management in Hobart in early 2011. The event was

attended by 50 mainly private geotechnical practitioners and local government planners.

MRT continues to coordinate the ongoing monitoring of the School Creek landslide in Hobart and the Lawrence Vale landslide in Launceston. Annual inclinometer surveys provide information for the management of these areas and their surrounds. The Tarooma near real-time monitoring system has recorded about 60 mm of movement on the School Creek landslide since it was installed and has established a relationship between long term rainfall, groundwater pressure and landslide movement. This information is providing a useful tool for understanding the risk to the local community which includes Tarooma Primary and Tarooma High schools. There has been no detectable movement on the inclinometers at Launceston.

MRT has provided technical assistance to the Kingborough Council to manage a grant from the Natural Disaster Resilience Programme that aims to undertake further studies in the Tarooma area and to formulate a long-term management plan for the active landslide. Stage 1 of the

project is well advanced with a local engineering company contracted to compile information relating to damage and ground movement since the last review in 2002. In conjunction, MRT has revised the existing geological mapping, especially in light of subsequent investigations, and produced the first ever 3D model of the landslide. Funding for stage 2 and 3 has been applied for and awarded.

The TIGER landslide database forms a critical data foundation for the Landslide Map Series. Ongoing data entry and maintenance occurred during the year and there are now about 2500 records from throughout Tasmania. The database is web enabled and publicly accessible. Development work has commenced in compiling several thousand records of material property information relating to engineering soils. This information will become part of MRT's TIGER database in the near future. General information regarding landslides (including digital maps) and other geohazards in Tasmania can be found on the MRT website.

Geoscience Information

The Geoscience Information Branch was formed in October 2009 to integrate a number of the geoscientific data acquisition, storage, presentation and delivery functions undertaken by MRT. The Branch has a staff of fourteen.

The main activities of the Branch in the 2010/2011 year were:

- Ongoing maintenance and development of the TIGER (Tasmanian Information on Geoscience and Exploration Resources) System.
- Geoscientific data management.
- Management and presentation of geological information for Tasmania.
- Spatial tenement management services.
- Scientific editing and publishing of a range of geoscientific reports.
- Management of mineral and offshore hydrocarbon exploration report accession, circulation and custodianship.
- Providing geoscientific information resources to MRT staff and external clients.
- Developing a three-dimensional model of northeast Tasmania.
- Supporting the information technology environment in MRT.
- Migrating data into the TIGER System.
- Preparing materials for MRT promotional activities.
- Provision of support CAD services.

The branch also provided geophysical services and advice to MRT and our clients.

Major branch achievements during the year included:

- Developing new TIGER modules for managing published maps and MRT plans.
- Completion of 37 revised 1:25 000 scale geological map areas in northeast Tasmania.
- Completing conversion of MRT's 1:250 000 and 1:500 000 scale geology maps from AGD66 to GDA94.
- Introducing significant improvements into a number of TIGER modules.
- Undertaking combined three-dimensional gravity and magnetic modelling of the area between the Scottsdale Batholith and the Tamar Graben.
- Building an increased information skills-base for MRT staff.
- Updating all MRT entries in the Tasmanian Spatial Data Directory/Australian Spatial Data Directory including changing to generic contacts.

Geophysics

Combined three-dimensional gravity and magnetic modelling of the area between the Scottsdale Batholith and the Tamar Graben has progressed to the completion of a first joint inversion of the geophysical data from the area. The model appears fundamentally sound but there is considerable heterogeneity in some of the geological unit volumes and the shallower units (Jurassic dolerite, Tertiary sediments) are not adequately resolved. Three-dimensional modelling of magnetisation distribution and magnetic intensity was also undertaken for the Savage River area.

Following the meeting of a technical working group with members from Geoscience Australia, GeoScience Victoria and MRT in June 2010, a National Geoscience Agreement to develop a three-dimensional geological model of southeastern Australia was signed. MRT has prepared a number of the datasets required as part of its contribution to the project.

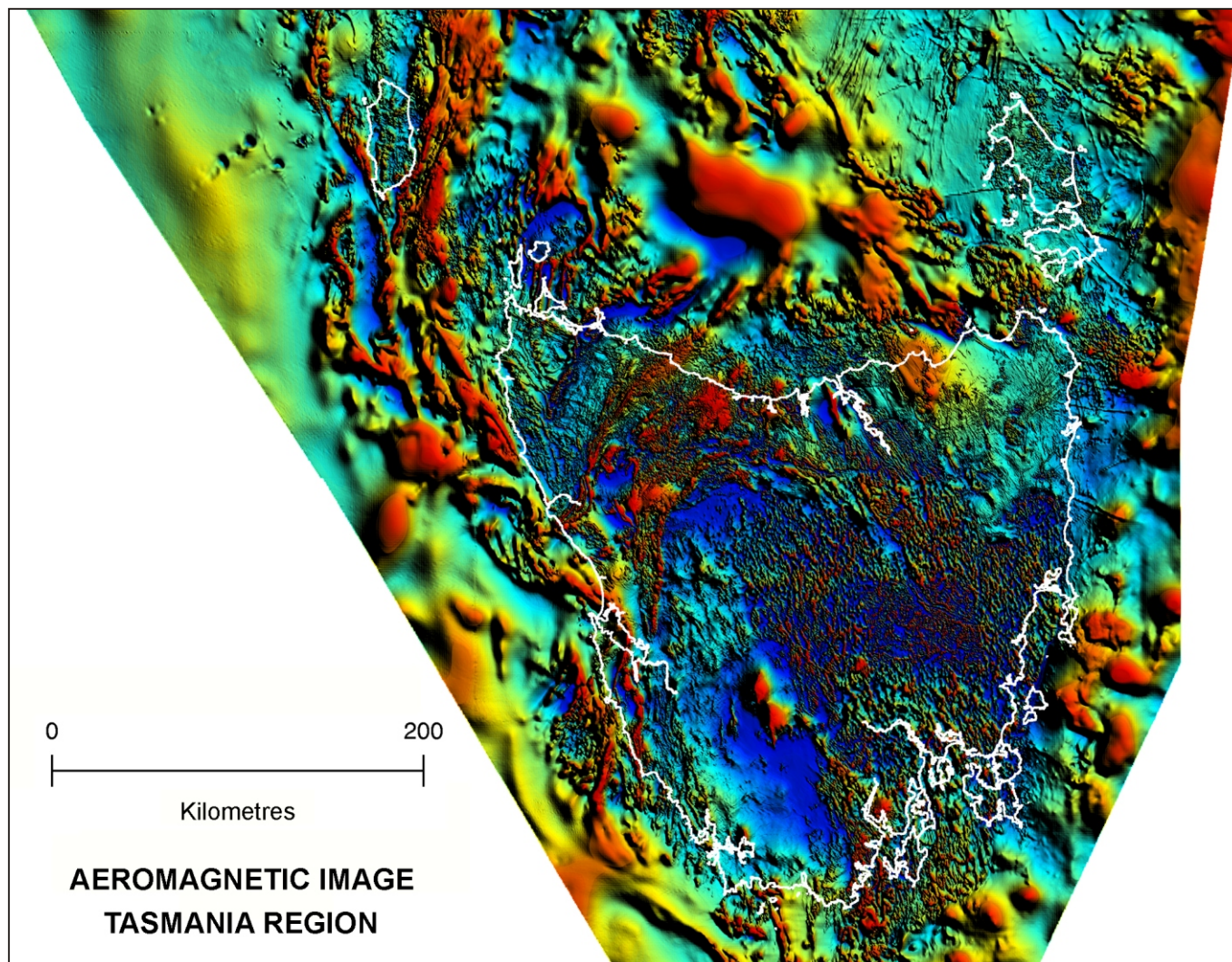
The project was accepted at a meeting of the Chief Government Geologists Committee in Melbourne in May 2011 for planned commencement in 2012/2013.

A joint project with Geoscience Australia to undertake a potential field study of areas off eastern Tasmania has been completed. Aeromagnetic data acquired in early 2011 from off the east coast of Tasmania as part of this project has been received and combined with existing data as a contribution to the unified view of the overall Tasmanian region.

Seismic reflection data acquired in the Zeehan area by a mineral exploration company have been reprocessed using the seismic scattered wave imaging method. The final processing report is still to be received. The data will allow an improved interpretation and 3D model of the area to be developed. All products will be released on open file in the near future.

The MRT website has indexes of open file geophysical data including gravity base stations, airborne geophysical surveys for which digital data are held, and gravity stations. Where applicable the basic digital data can also be downloaded and new open-file data has been added to the website as it is received. Links are provided on the website to documents relating to the airborne surveys. Geodetic survey control point information can easily be retrieved via a link to The LIST after carrying out a map-based search on the MRT website.

During the year there was an increase of 164 in the number of open and closed-file gravity readings held within the Tasmanian database which now contains a total of 82,085 stations. Significant gaps still remain in the coverage with major gaps to be targeted by projects in future years. The gravity base station information available on the MRT website continued to be extended with the addition of a several new stations. As new data have been received further checking of old readings has been undertaken and a number of dubious readings have been corrected or deleted. Geoscience Australia has been provided with all updated open file data.



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, has been supported entirely from MRT resources. As recommended in the 2006 review, maintenance and targeted enhancement of the TIGER System has been undertaken by means of a series of small contracts where the contractors work closely with TIGER operations staff and other MRT staff. This strategy has proven effective, with a number of significant improvements being made to all the TIGER intranet applications used by MRT staff and to searching and delivery of information on the MRT website.

Using the TIGER System MRT staff enter, maintain and search corporate data relating to all aspects of MRT's activities including tenements, exploration reports, MRT publications, drilling, geohazards, samples, geochemistry and observations, mineral deposits and geophysics from a number of browser-based thin client applications accessed via the MRT intranet. The MRT website enables access to this corporate data and associated metadata from anywhere in the world with internet access. Data are delivered to clients through the MRT website using customised textual and spatial searches and a number of basic data sets are also available for download. A total of 14 731 GB (after adjustment) was downloaded from the MRT website this year compared to 9796 GB last year; this increase is

assumed to reflect the increase in exploration activity as financial constraints eased. The number of visits per day has also risen substantially to an average of 1185 from last year's average value of 836 over the course of the year.

Major enhancements to TIGER this year included enhancement of the map viewer client across both the MRT internet site and throughout the internal TIGER applications, development and implementation of TIGER modules for managing published maps and MRT plans, and implementation of generic document/file uploading and downloading across TIGER modules. The range of information available for client download has been increased to include geology at 1:25 000, 1:250 000 and 1:500 000 scales, and sample and geochemical information.

IT summary

New PCs are purchased with the Microsoft Windows XP operating system but are being specified so that they can be upgraded to Windows 7. All desktop PCs run Microsoft Office 2007. For spatial analysis MRT uses both ESRI products and MapInfo. Staff in the field are now routinely using wireless broadband to access the MRT network.

There are several network PC servers running Windows Server. The main PC network server is running Netware 6.5 with approximately 600 gigabytes of on-line storage but preparation for migration to Novell Open Enterprise Server has commenced. Windows servers provide anti-virus, email,

intranet and image delivery services to MRT staff. The first stage of consolidating the main Unix servers to reduce overheads has commenced. Files on the corporate Unix systems are accessed from PCs using Samba software. Windows Server Update Services is implemented throughout the Microsoft-based components of the MRT network. Single sign-on is used across the entire network including PC servers, the TIGER system, Mail and Unix servers and has reduced the burden on users previously required to remember and maintain separate passwords for each function. MRT moved to a whole-of-government email platform early in 2010/2011 thus providing integrated mail and calendaring functionality across several State government departments.

Unix systems provide corporate information technology services to MRT staff. In addition there are Unix servers dedicated to development and testing for the TIGER System, for the MRT intranet, and for Samba. A further two Unix servers host the MRT website. The MRT website is located in the Rosny Park building to simplify maintenance and up-loading of data to the website servers and has a 50 Mbit/sec connection to the internet. A 1 Mbit/sec link is used from Rosny Park to the Mornington complex.

MRT uses a number of specialised applications, including GoCAD and GeoModeller, and controls a range of equipment including an XRF spectrometer and an X-ray diffractometer. Legacy DOS applications have been supported using a virtual machine. MS Outlook-based meeting room and vehicle booking systems have been implemented following transfer to the whole-of-government email and calendaring environment.

Through the Chief Government Geologists' Committee and the Government Geoscience Information Committee MRT has been involved in development work by AuScope Limited to make geoscientific information available using OGC web standards. MRT started delivering mineral occurrence data using web services early in 2009/2010 and is also delivering drill hole information as part of the National Virtual Core Library using a web feature service. Both GeoServer and the Spatial Information Services Stack were updated in the second half of the year before completion of AuScope/National Collaborative Research Infrastructure Strategy on 30 June.

Use of the MRT website increased significantly, with an average monthly download volume of 1228 GB compared to 816 GB last year, and a peak monthly download volume of 2311 GB. The recorded volume of downloads from the MRT website totalled 58 459 gigabytes for the year compared with a total of 9 796 gigabytes in the previous year. Approximately 43 728 gigabytes of this resulted from downloads to one site in the month of January. After discounting this exception, the total download volume of 14 731 gigabytes is substantially higher than in the previous year. The daily average number of visits increased from an average of 836 per day last year to an average of 1185 per day this year. This heightened level of downloads and website visits is attributed to the increase in the nature and volume of information available which allows clients to download required information immediately rather than needing to place a formal order with MRT. In addition the

rapidly increasing level of mineral exploration activity following the period of financial constraint is also expected to have a positive effect. The MRT website provides a high-speed access point for clients to access the open-file data held in the MRT corporate information management system. Oracle spatial replication is used between MRT's internal and web servers. The website offers an Open Geospatial Consortium Web Map Service allowing connection from popular GIS packages to a restricted number of data sets. Larger datasets stored on the file system are automatically replicated on a daily basis, and made available for download, as they become open file.

Exploration Reports

Capture of metadata summarising technical documents relating to onshore exploration continued throughout the year, with 221 new summaries entered and an additional 441 summaries updated. The number of new reports received is significantly less than in the previous year when incoming report numbers were boosted by a large number of final reports associated with relinquishments of exploration tenements. 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 required to be in the national standard format for digital reporting and compliance with the report format at initial lodgement has improved from approximately 95 per cent to approximately 97 per cent. This is an improvement over the previous year and appears to correspond to an increase in the number of explorers operating in a number of Australian jurisdictions and using the one format for all digital reporting. Consultation with and assistance to stakeholders has ensured that non-compliant reports have been updated to conform to the data formats detailed in the national guidelines. Because of the extended time before GDA94 topographic base maps will be available for all of Tasmania all incoming reports continue to be checked to ensure that the geodetic datum used is clearly specified.

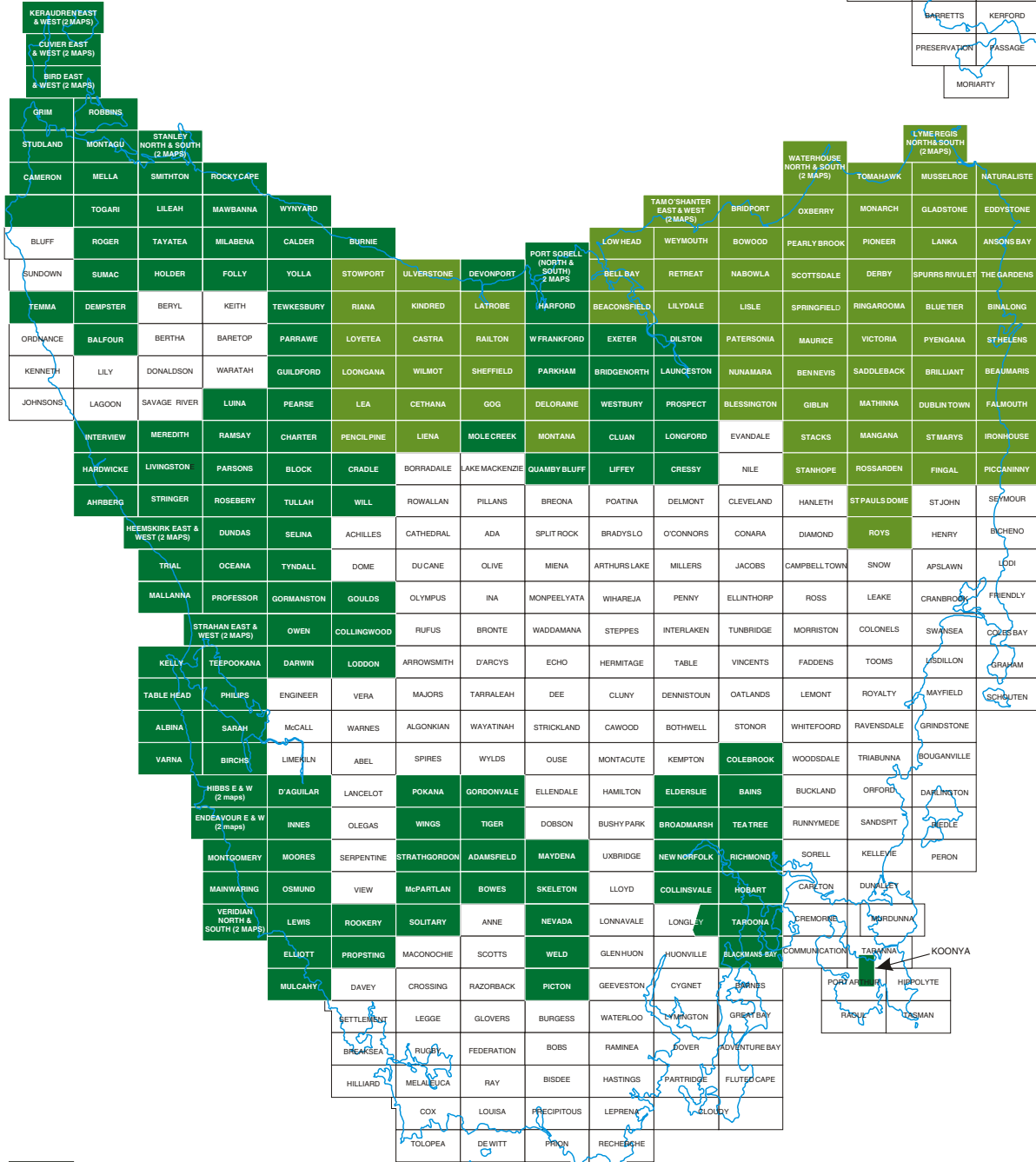
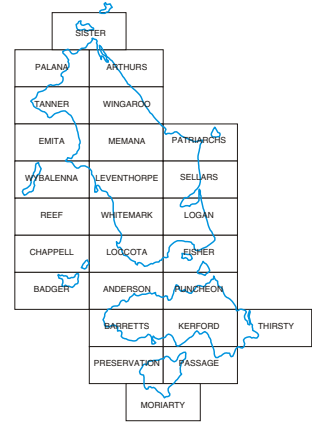
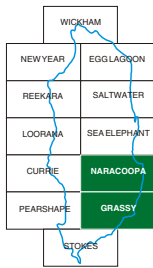
The Branch assumed responsibility for accessioning offshore hydrocarbon exploration reports from April 2011.

Spatial Information Services

During 2010/2011 the revision of 1:25 000 scale digital geological data continued under the *TasExplore* project. This work resulted in the completion of a further 41 revised map areas in northeast Tasmania (Binalong, Lisle, Patersonia, Brilliant, Dublin Town, Oxberry, Pearly Brook, Scottsdale, Springfield, Maurice, Pioneer, Derby, Ringarooma, Victoria, Saddleback, Lyme Regis, Naturaliste, Waterhouse, Eddystone, Tomahawk, Musselroe, Gladstone, Beaconsfield, Pyengana, St Helens, St Marys, Ironhouse, Fingal, Piccaninny, Mathinna, Mangana, Ben Nevis, Giblin, Stacks, Stanhope, Rossarden, St Pauls Dome, Roys, Blessington, Nunamara and Monarch).

The conversion of MRT's 1:250 000 and 1:500 000 scale digital geology maps from the AGD66 datum to the GDA94 datum has been completed. The conversion of 1:25 000

1:25 000 SCALE DIGITAL GEOLOGICAL MAP PROGRAM As at 1 July 2011



- Map complete
- Map revised under *TasExplore*

MINERAL RESOURCES TASMANIA
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scale digital geology maps is progressing well, with 200 of the 207 maps now converted

CAD continues to be used as a support tool for many projects, with 45 maps and plans and 178 tenement maps and diagrams being produced throughout the year.

Tenement related work included:

- 70 new exploration license applications processed and entered into the MRT spatial tenement information system;
- 38 Exploration Release Area plans produced and entered into the MRT spatial tenement information system;
- 26 new mining leases processed and entered into the MRT spatial tenement information system; and
- the production of maps and data files for 80 proposed work programs for exploration licenses.

A total of 419 hardcopy output products of digital geology and tenement data were produced on demand using the agency's inkjet plotters and 101 data sets of digital data were produced for clients.

Information and Access Services — Geoscientific Publications

MRT produces a range of products to support its activities, including geological reports, promotional documents, newsletters, materials for displays, Exploration Release Area flyers, and other reports and promotional materials as required.

Major publications produced during the year included:

- The Mineral Resources Tasmania *Annual Review* for the year 2009/2010.
- *Explanatory Report for the Dublin Town (5840), Brilliant (5841), Falmouth (6040) and Beaumaris (6041) geological map sheets*, by M. A. Worthing and I. R. Woolward. (Explanatory Report 1:25 000 Scale Digital Geological Map Series Mineral Resources Tasmania 3).
- *Geological Atlas 1:50 000 series. Sheet 78 (7912S). Montgomery*, by A. V. Brown (Explanatory Report Geological Survey Tasmania).

Forty-one flyers promoting Exploration Release Areas were produced. A considerable amount of promotional and display material was produced as required.

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

- 2010/01 — *Tasmanian Landslide Map Series: User guide and technical methodology*, by C. Mazengarb and M. D. Stevenson.
- 2010/02 — *A review of Cambrian megabreccias in the Penguin–Ulverstone area, central northern Tasmania*, by D. B. Seymour and M. J. Vicary.

- 2011/01 — *A ground-truthing survey in the Interview River area, northwest Tasmania*, by J. Taheri, R. S. Bottrill and G. R. Green.

Work continued on adding and upgrading entries on the DOMINFO database, with twenty-three old reports, mainly on geological site investigations, being made available for downloading.

Information and Access Services — Geoscience Information and Library Service

The Geoscience Information and Library Service supports the core activities of MRT by providing geoscientific information resources to staff, mineral exploration companies, geotechnical consultants, local authorities, researchers, students and members of the public.

The service is staffed by a full-time Geoscience Information Officer.

Technical services

This year responsibility for the PETXPLORE process for oil exploration company report accessioning and circulation was transferred to the Geoscience Information Officer. This is an expansion of the existing TASXPLORE responsibilities. Following the transfer the process has been reviewed and documented. The process includes the initial indexing and processing of company reports lodged with MRT and their circulation to assessing geologists. Retrospective accessioning of previously received reports and making digital copies where necessary was undertaken.

The Inmagic DB/Textworks library management software was upgraded to version 13.00.

Collection

One journal subscription was cancelled and one new journal subscription was added to the collection. Journal subscriptions continue to be managed by the Geoscience Information Officer to avoid the overheads charged by commercial subscription services.

Significant culling of superseded, irrelevant and outdated items was undertaken to free up shelf space. This is an ongoing process.

Electronic access

The combined catalogues of the MRT Library and the DIER Library are available from their respective intranet sites using WebPublisher software hosted by the Telecommunications Management Division of the Department of Premier and Cabinet. Regular updates of the catalogue are loaded.

The MRT intranet pages were regularly updated to provide current geoscience information and resources.

Online access to journal subscriptions is provided to all titles where full-text access is included in the cost of the print subscription and to a selection of relevant titles only available electronically.

Royalty, Finance and Administration

This branch provides the corporate support function for Mineral Resources Tasmania. The main activities of the branch include:

- Ensuring that effective royalty and fee collection systems and assessment programs are in place so that revenues are properly managed and accounted for to the satisfaction of the Auditor General.
- The timely provision of financial, accounting and administrative advice to the division in conjunction with departmental corporate services.
- The responsibility for the issue of mining titles in accordance with the *Mineral Resources Development Act 1995* and petroleum titles under the *Offshore Petroleum and Greenhouse Gas Storage Act 2006*.
- The collection, collation and reporting of information related to the minerals industry.
- Ensuring that all corporate information is kept in an orderly manner and is readily retrievable.
- Providing executive support to the Director of Mineral Resources Tasmania.

Tenement Administration

The Tenement Administration Section maintains a number of mineral tenement registers.

The section provides advice to officers from all levels of government, the mining industry, the legal profession and the general public on a wide range of matters associated with mineral tenements and legislation.

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

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

The section is also responsible for the compilation of data to enable the collection of mineral tenement rentals and royalties for the State.

Requesting and collation of production and expenditure statistics is an important and essential activity carried out by the section. These statistics provide the base data for assessment of the performance of the mining and exploration industries in Tasmania.

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 sheets.

Seventy-four Exploration Release Areas (ERA), covering 31 510 km², were offered to potential explorers by way of the *TasXplorer* news sheet, which is circulated widely within the Australian mining community. The faxing of the news sheet was suspended during the period with email and web

becoming the preferred methods of distribution. The news sheet is currently sent to 154 clients of MRT by email. Applications were received for areas within twenty-one of the advertised ERAs resulting in twenty-three successful exploration licence applications covering 6526 km² of ground.

Officers of the section also play a key role in the maintenance of the REGIS module within the TIGER database management system.

Mineral Legislation

The *Mineral Resources Development Act 1995* is the principal legislation relating to the management and regulation of mineral tenements in Tasmania.

Mineral Resources Tasmania provides information through Service Tasmania outlets and forms approved under the *Mineral Resources Development Act 1995* are available for downloading on the MRT website.

The *Mineral Resources Regulations 2006* (the Regulations), replacing the *Mineral Resources Regulations 1996*, came into force on 28 June 2006. The Regulations were amended by the *Mineral Resources Amendment Regulations 2011* effective 17 August 2011.

Mining Tribunal

Under the *Mineral Resources Development Act 1995*, a Mining Tribunal, consisting of a magistrate, has jurisdiction to hear a wide range of mining disputes.

The Act places an obligation on the Director of Mines to attempt to resolve disputes before the tribunal. In effect this usually consists of informal mediation, arranged by the Director 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.

Tribunal Claims

Tribunal claims and objections lodged with Mineral Resources Tasmania during the year ending 30 June 2011, or still in progress, were:

EL12/2010 — *Various Objectors (4) v Avondale Resources Pty Ltd*

- Objections by land owners not wanting exploration on property. Tenement application withdrawn prior to mediation.

EL13/2010 — *Various Objectors (8) v ABx4 Pty Ltd*

- Objections by land owners not wanting exploration on properties, impact on export industries, impact of lucrative farming businesses and prime agricultural land. Tenement application withdrawn prior to mediation.

EL23/2010 — *Simon Cameron v Black Rock Energy Pty Ltd*

- Company excluded area in question from the application area prior to mediation. Objection resolved.

EL17/2003 — Stonehenge Metals Ltd

- Appeal received from licensee against Minister’s decision to refuse Application for Extension of Term. Mining Tribunal adjourned decision *sine die*. Transfer of licence pending.

EL11/2007 & EL25/2006 — Merdon Exploration Pty Ltd

- Appealed against Minister’s decision to revoke licences. Following court hearings, licensee decided not to continue with licence and surrendered tenements.

EL30/2010 — North East Bioregional Network Inc v Australia China Corporation of Coal Geology Engineering Pty Ltd

- Objection lodged in regard to conservation values in the Blue Tier Area. Objection resolved following mediation.

EL31/2010 — Various Objectors (3) v Australia China Corporation of Coal Geology Engineering Pty Ltd

- Objections included concerns with effect on conservation values, effect on eco-tourism facility on private property and landowner concerns with future mining. Objections resolved following mediation.

EL37/2010 — Various Objectors (7) v ABx4 Pty Ltd

- Objections included environmental impact. Resolved after mediation. All objector’s properties excluded from application area.

EL35/2010 — Tasmanian Aboriginal Centre Inc. v Duggans Pty Ltd

- Objector stated claims of having estate or interest. Objection withdrawn following mediation.

EL49/2010 — North East Bioregional Network Inc v Tamar Gold Pty Ltd

- Objections included environmental impact on upper catchment of the Avenue River as well as any threatened flora and fauna. Resolved after mediation.

EL53/2010 — Riggall P v Tamar Gold Pty Ltd

- Objection lodged due to private property being subject of a conservation covenant under the Private

Reserve Scheme. Property now administratively excluded from the licence area. Objection withdrawn.

RL3/1997 — B3 (Bell Bay Bluestone) Pty Ltd

- Appeal against the Minister’s decision to refuse Extension of Term. Not resolved as at 30 June 2011.

EL52/2010 — North East Bioregional Network Inc v Tamar Gold Pty Ltd

- Objection based on impact to natural vegetation such as rainforest, threatened flora, etc.. Resolved after mediation.

EL26/2010 — North West Walking Club v Ironsearch Pty Ltd

- Objection lodged due to concerns with disturbance to walking tracks and surrounding wilderness. Track excluded to satisfaction of objector. Objection withdrawn.

EL44/2010 — Various Objectors (35) v Frontier Resources Ltd

- Various objectors (35) with environmental concerns with ELA. Majority of objectors are landowners. Tenement application withdrawn.

EL36/2010 — Tarkine National Coalition Incorporated v Gregory R A (Ron Gregory Prospecting)

- Objection based on environmental concerns and impact on threatened species. Progressing.

EL6/2011 — Tarkine National Coalition Incorporated v Frontier Resources Ltd

- Objection based on concerns with damage to environment and impact on threatened species. Progressing.

EL39/2010 — North East Bioregional Network Inc. v Happy Mining Pty Ltd

- Objection based on conservation issues. Progressing.

EL4/2011 — Various Objectors (3) v TNT Mines Ltd

- Objections lodged based on effects of exploration and mining within fishing grounds. Progressing.

Lease applications, 2010/2011

Total number of all types of exploration rights held as at 30 June 2011

| Mineral tenement type | Number | Area |
|--|-------------|------------------------------|
| Exploration Licences | 215# | 49 474 km² |
| Category 1 (Metallic minerals) | 173 | 13 064 km ² |
| Category 2 (Fuel minerals) | 13 | 1 817 km ² |
| Category 3 (Construction minerals) | 27 | 1 655 km ² |
| Category 4 (Oil – onshore) | 4 | 16 002 km ² |
| Category 5 (Industrial minerals) | 59 | 4 257 km ² |
| Category 6 (Geothermal) | 6 | 17 500 km ² |
| Retention Licences | 31# | 246 km² |
| Category 1 (Metallic minerals) | 18 | 55 km ² |
| Category 2 (Fuel minerals) | 5 | 163 km ² |
| Category 3 (Construction minerals) | 10 | 36 km ² |
| Category 5 (Industrial minerals) | 14 | 47 km ² |
| Prospectors Licences issued | 246 | N/A |
| Permits to explore for minerals under the Commonwealth Offshore Minerals Act 1994 | 2 | 94 blocks |
| Retention Licence under the Commonwealth Offshore Minerals Act 1994 | - | - blocks |
| Permits to explore for petroleum under the Commonwealth Offshore Petroleum & Greenhouse Gas Storage Act 2006 (OPGGSA 2006) | 14 | 617 blocks |
| Retention Licence under the OPGGSA 2006 | - | - blocks |
| Pipeline licences held under the OPGGSA 2006 | 3 | |
| Pipeline licences held under the Tasmanian Petroleum (Submerged Lands) Act 1982 | 1 | |
| Production licences held under the OPGGSA 2006 | 3 | 8 blocks |

(# Note: Exploration licences and retention licences may include more than one category)

Leases applied for in 2010/2011

| Product | Number | Area (ha) |
|------------------|-----------|--------------|
| Dolerite | 2 | 163 |
| Easement | 1 | 8 |
| Gold | 2 | 90 |
| Gravel | 10 | 117 |
| Gravel and clay | 1 | 2 |
| Limestone | 1 | 25 |
| Magnetite | 1 | 778 |
| Silica | 1 | 275 |
| Stone | 2 | 191 |
| Stone and gravel | 1 | 93 |
| Zinc | 1 | 4 |
| Total | 23 | 1 746 |

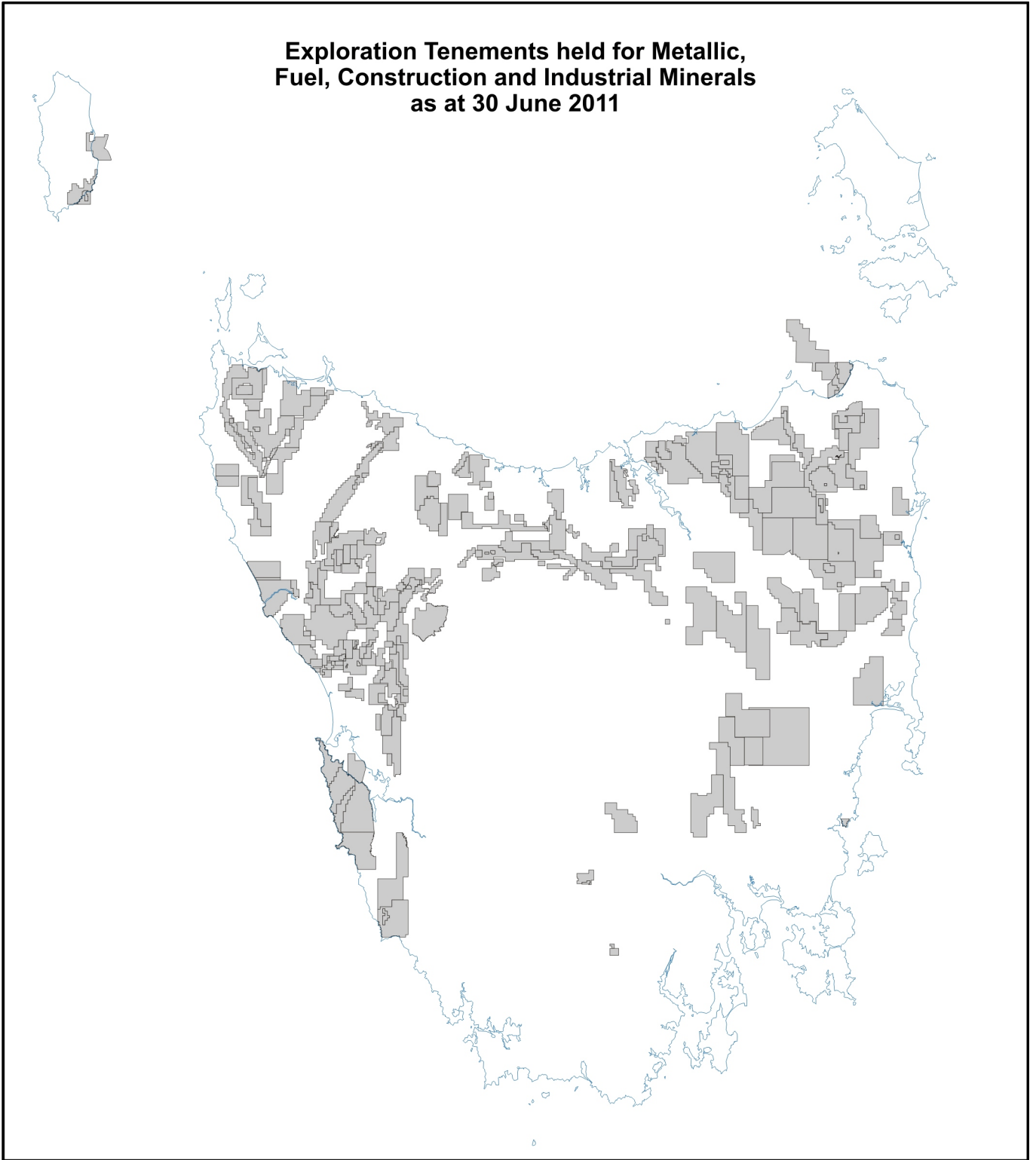
Leases granted in 2010/2011

| Product | Number | Area (ha) |
|------------------|-----------|-------------|
| Dolerite | 1 | 6 |
| Dolomite | 1 | 2 |
| Easement | 2 | 5 |
| Gold | 1 | 67 |
| Gravel | 11 | 186 |
| Magnesite | 1 | 223 |
| Nickel | 1 | 902 |
| Quartzite | 1 | 205 |
| Sand | 1 | 86 |
| Silica | 1 | 200 |
| Stone | 2 | 28 |
| Stone and Gravel | 2 | 103 |
| Zinc | 1 | 4 |
| Total | 26 | 2017 |

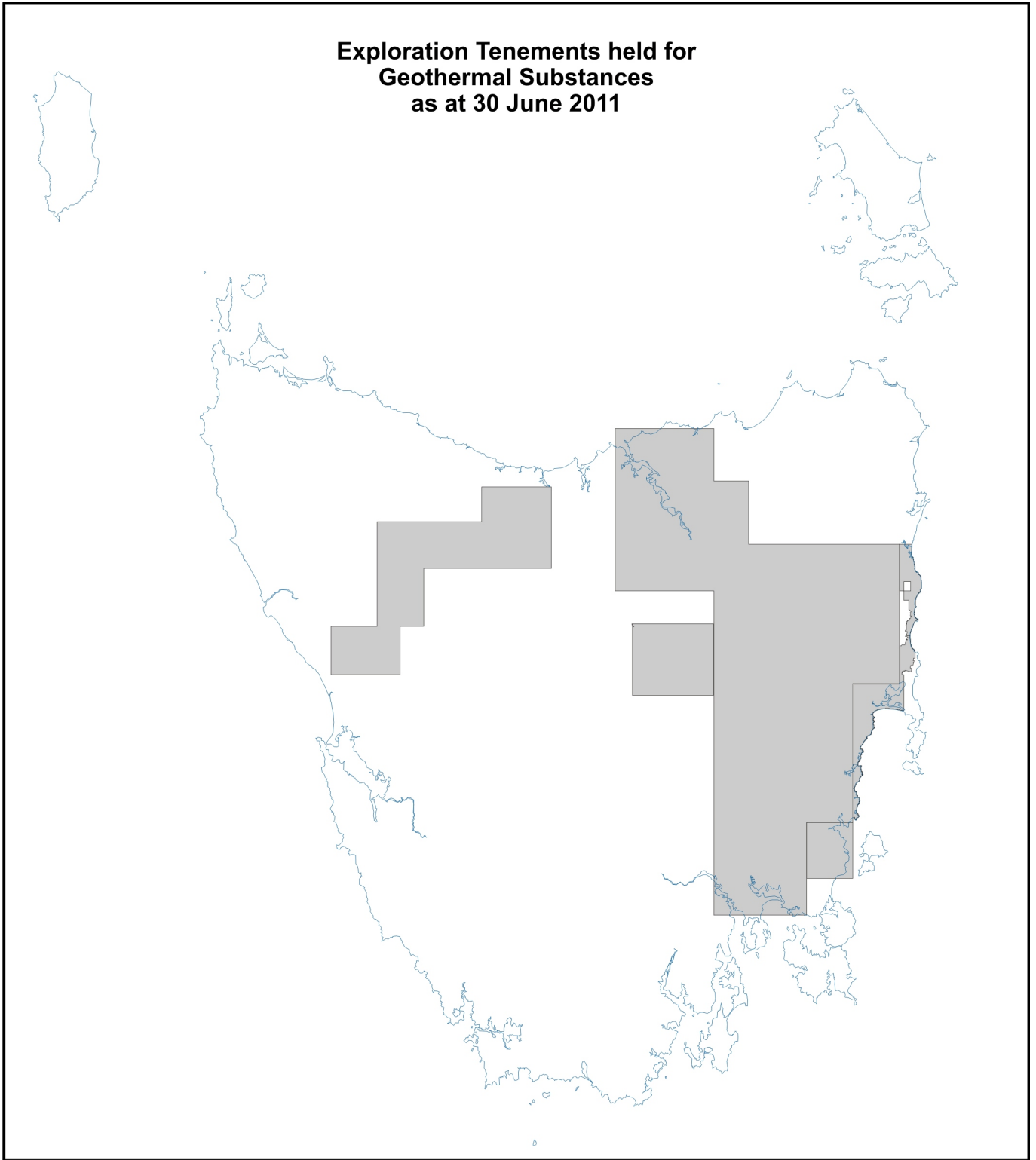
Total number of leases in force at 30 June 2011

| Product | Number | Area (ha) |
|------------------------|------------|---------------|
| All minerals | 22 | 17 451 |
| All minerals and stone | 4 | 5 739 |
| Clay | 5 | 94 |
| Coal | 3 | 6 589 |
| Coal and stone | 1 | 175 |
| Copper | 1 | 5 |
| Dolerite | 6 | 1 204 |
| Dolomite | 3 | 140 |
| Easement | 17 | 1 949 |
| Gold | 7 | 834 |
| Granite | 3 | 26 |
| Gravel | 169 | 3 101 |
| Gravel and clay | 2 | 31 |
| Lime sand | 3 | 21 |
| Limestone | 7 | 1 318 |
| Magnesite | 1 | 223 |
| Magnetite | 1 | 778 |
| Nickel | 2 | 1 302 |
| Peat | 1 | 9 |
| Quartzite | 2 | 396 |
| Sand | 55 | 2 565 |
| Sand and gravel | 24 | 1 298 |
| Sand and stone | 12 | 639 |
| Sandstone | 5 | 34 |
| Shale | 1 | 32 |
| Shale and specimens | 1 | 3 |
| Silica | 3 | 524 |
| Silica sand | 1 | 20 |
| Slate | 3 | 165 |
| Specimens | 6 | 62 |
| Stone | 191 | 4 548 |
| Stone and gravel | 20 | 383 |
| Tin | 13 | 962 |
| Tungsten | 1 | 544 |
| Zinc | 1 | 4 |
| Total | 597 | 53 168 |

**Exploration Tenements held for Metallic,
Fuel, Construction and Industrial Minerals
as at 30 June 2011**



**Exploration Tenements held for
Geothermal Substances
as at 30 June 2011**



Mineral Sector Overview

The mineral extraction and processing sector continues to be Tasmania's largest export industry, amounting to 49.4% of mercantile exports in 2010/2011 (worth \$1.570 billion, ABS figures). Royalty revenue collected for the State by MRT totalled \$45.3 million in 2010/2011.

MRT, by providing information on areas of high mineral resource potential in Tasmania, encourages private sector exploration which is essential to the development of new operations. By ensuring an adequate return from our mineral resources, all Tasmanians can share the benefits of our mineral wealth.

Metal prices generally rose during the first part of the year, although the positive effect of the rises was partly negated by the strong appreciation of the Australian dollar against the US dollar. The price of gold in US dollars rose strongly throughout the year but was more volatile in Australian dollars. The price of other commodities tended to stabilise in the middle part of the year before showing some indication of decline towards the end of 2010/2011.

A high level of mineral exploration activity is essential for the future development of the mineral sector and for the economic well-being of Tasmania. The recovery in mineral exploration investment, which began in 2009/2010, was maintained through the year.

Sixty-one Exploration Licence applications and two Offshore Mineral Exploration Licence applications were received during the year. Seventy-four Exploration Release Areas (ERA) were advertised during the year, with 23 licences being awarded from these ERAs.

The **Minerals and Metals Group (MMG)** Rosebery mine continued to operate profitably during the year, and continued successful exploration in the year to June 2010 resulted in increases in resources of zinc by 11.5%, in lead by 24.5%, in copper by 9.3%, in silver by 23.0% and in gold by 26.3%. The MMG-owned Avebury nickel mine remained on care and maintenance throughout the year, but the company completed a \$3 million review of the operation, including a drilling campaign to establish more resources.

Bass Metals Ltd completed development of the Fossey zone zinc-lead deposit, south of the Hellyer mine, and commenced production of ore and zinc, lead and copper concentrates during the year. Production from the Que River mine ceased, but further production from Que River and Hellyer, as well as resumption of tailings re-treatment and processing to concentrates at the Hellyer mill, are under consideration for the future.

Grange Resources Limited is expanding the open-cut mine at Savage River and is strongly profitable following further increases in iron ore pellet prices. The current mine plan extends to 2026, but there is potential for a further ten years operation.

Bluestone Mines Tasmania Joint Venture Pty Ltd, which owns and operates the Renison Bell underground tin mine, is a partnership between the ASX-listed Metals X Limited (Metals X), and YT Parksong Australia Holdings Pty Ltd (YTPAH), a wholly-owned subsidiary of the world's largest tin producer, the Yunnan Tin Group and Parksong

Holdings, a Hong Kong registered company. The mine operated profitably throughout the year, during which production of copper-silver concentrate commenced for the first time in the mine's history. A 12 300 metre drilling campaign made several significant intersections of tin and copper and a resource recalculation is underway.

King Island Scheelite Limited has recalculated resources for a higher grade underground mining operation instead of the expanded open cut originally envisaged. The company now plans to resume production in late 2012 with the treatment of tailings to recover a scheelite concentrate. Underground ore production from the Dolphin mine is expected to start in early 2014.

Unity Mining Limited has doubled the resources at the Henty gold mine through a major and ongoing exploration program and the mine life has been extended to at least a further four years. Recent exploration drilling has intersected ore grade gold at Red Hills, two kilometres northeast of the mine.

Copper Mines of Tasmania continues to examine the feasibility of developing the Western Tharsis deposit and the Mount Lyell mine continues to operate profitably.

The receiver of **Van Dieman Mines Pty Ltd** failed to attract a purchaser for the alluvial tin assets in the Gladstone area.

Tasmanian Advanced Minerals Pty Ltd continued silica flour extraction from tenements at Corinna and Blackwater with silica flour treatment at its plant near Wynyard. The company has been granted a new mining lease at Hawkes Creek in northwest Tasmania.

Exploration successes during the year included:

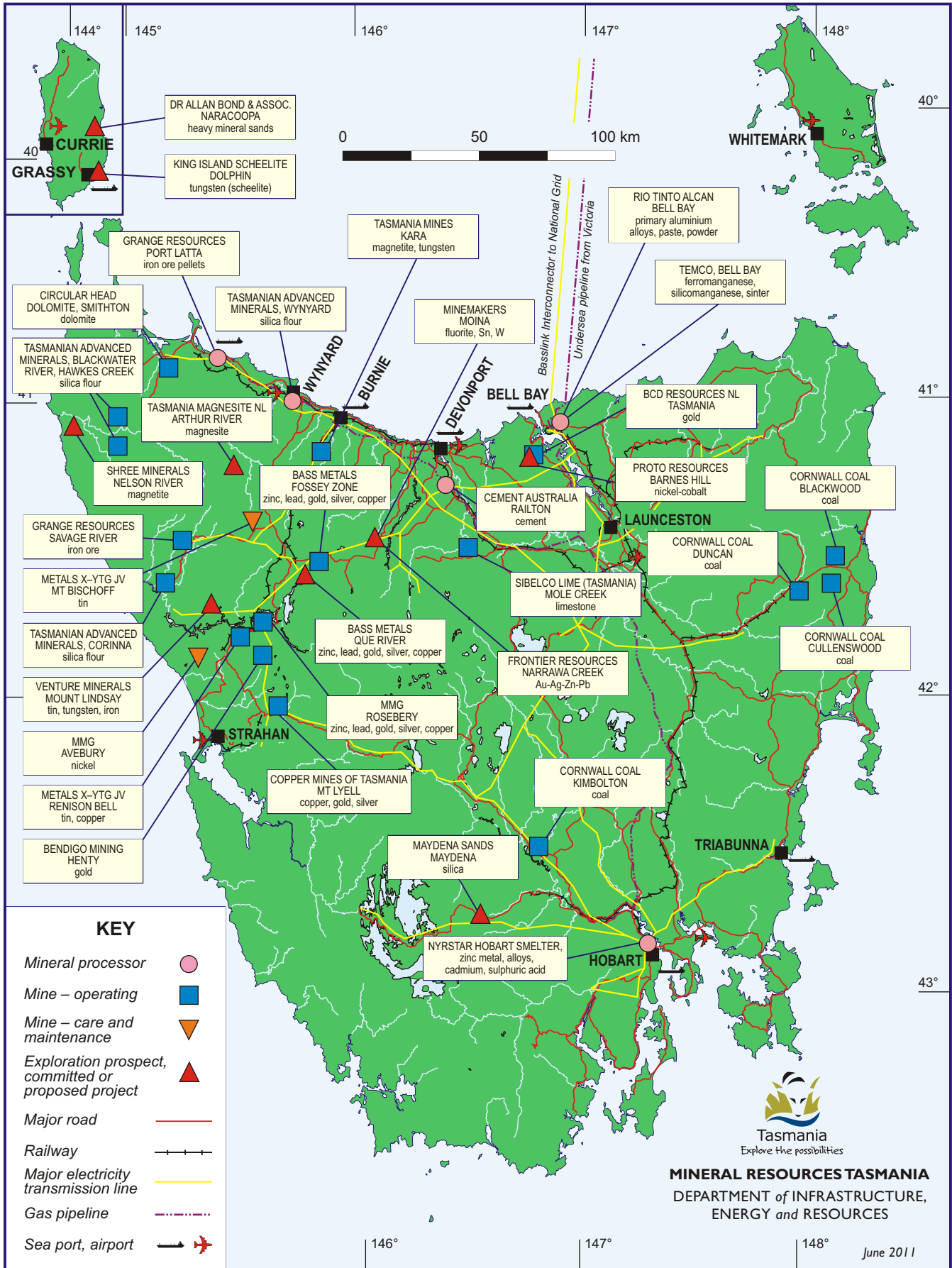
- The completion of a successful scoping study into developing tin, tungsten and magnetite resources at Mount Lindsay, north of Renison Bell, by Venture Minerals Limited to be followed by a full feasibility study.
- Further progress towards developing a nickel laterite deposit near Beaconsfield by Proto Resources and Investments Ltd, including an application for a mining lease.
- Ore-grade gold intersections at Red Hills by Unity Mining Ltd.
- Commencement of a feasibility study into mining hematite and magnetite at the Nelson Bay River by Shree Minerals Ltd.

Definition of ore grade tin resources at Queen Hill, Zeehan, by Stellar Resources Ltd, with a scoping study to follow.

The Thylacine and Yolla gasfields, which are both in Tasmanian waters, continue to produce gas which is piped to Victoria. Two petroleum exploration wells were drilled in Tasmanian offshore waters; Silvereye-I and Craigow-I, both in the Bass Basin. Neither well encountered commercial hydrocarbons. Four offshore seismic surveys and one seabed sampling survey were undertaken during the year.

— Tasmania —

Major Mining and Mineral Processing Operations and Proposed Projects



Value of the Tasmanian Mineral Industry

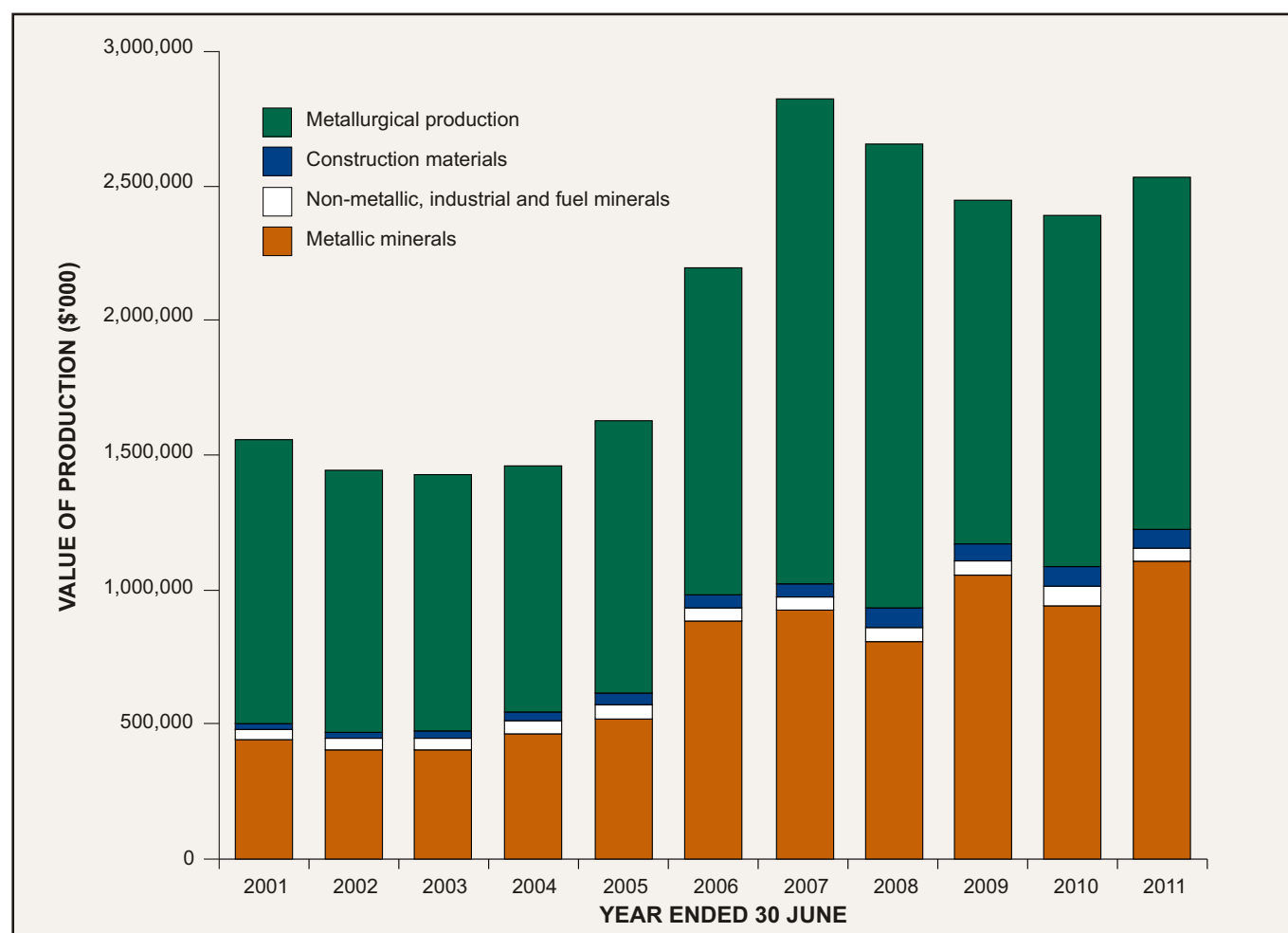
| Year ended Commodity | Unit | 30 June 2010† Total Quantity | 30 June 2011 Total Quantity |
|---|-------------------|---------------------------------|--------------------------------|
| Metallic Minerals | | | |
| Copper (assayed) | (tonne) | 25 593 | 25 135 |
| Gold (assayed) | (kilogram) | 4 595 | 4 408 |
| Iron ore pellets | (tonne) | 2 359 127 | 1 840 224 |
| Iron (in magnetite) | (tonne) | 126 666 | 159 178 |
| Lead (assayed) | (tonne) | 25 704 | 29 058 |
| Nickel (assayed) | (tonne) | 0 | 0 |
| Scheelite | (tonne) | 11 | 40 |
| Silver (assayed) | (kilogram) | 87 417 | 91 795 |
| Tin (assayed) | (tonne) | 5 956 | 5 034 |
| Zinc (assayed) | (tonne) | 83 565 | 92 711 |
| Value of metallic minerals | | \$937 822 757 | \$1 105 135 259 |
| Non-metallic, Industrial and Fuel Minerals | | | |
| Clay — Brick | (tonne) | 40 322 | 21 893 |
| Other | (tonne) | 0 | 0 |
| Kaolin | (tonne) | 7 946 | 6 032 |
| Dolomite — Agricultural | (tonne) | 35 874 | 37 487 |
| Chemical and metallurgical | (tonne) | 43 526 | 42 500 |
| Limestone — Agricultural | (tonne) | 124 399 | 100 981 |
| Cement | (tonne) | 1 726 609 | 1 592 707 |
| Chemical and metallurgical | (tonne) | 14 234 | 16 600 |
| Other | (tonne) | 52 304 | 43 080 |
| Silica (glass and other) | (tonne) | 116 551 | 122 417 |
| Silica (metallurgical) | (tonne) | 54 083 | 41 514 |
| Coal (run of mine) | (tonne) | 621 988 | 540 024 |
| Coal (washed) | (tonne) | 378 785 | 342 760 |
| Peat | (m ³) | 5 | 4 |
| Gemstones | (kg) | ‡ | ‡ |
| Value of non-metallic, industrial and fuel minerals | | \$78 244 160 | \$46 432 533 |
| Construction Materials | | | |
| Building stone — Freestone | (tonne) | 729 | 151 |
| Other | (tonne) | 10 654 | 12 751 |
| Sandstone | (tonne) | 1 976 | 1 516 |
| Crushed and broken stone — | | | |
| Basalt | (tonne) | 1 052 313 | 1 005 007 |
| Dolerite | (tonne) | 1 339 720 | 1 558 639 |
| Limestone | (tonne) | 122 993 | 233 353 |
| Sandstone | (tonne) | 308 | 24 |
| Other | (tonne) | 200 162 | 205 447 |
| Gravel (aggregate) | (tonne) | 31 146 | 49 767 |
| Sand | (tonne) | 681 952 | 674 791 |
| Other road materials | (tonne) | 2 160 926 | 1 859 072 |
| Value of construction materials | | \$72 201 446 | \$75 834 295 |
| Total value with Australian metal prices | | \$1 088 268 363 | \$1 227 402 087 |
| Value added production from Tasmanian and other ores | | \$1 304 892 576 | \$1 360 201 529 |
| (aluminium, cadmium, cement, lead-copper, ferromanganese, silicomanganese, sinter, sulphuric acid, superphosphate, zinc) | | | |
| Total value of mining and metallurgical production | | \$2 393 160 939 | \$2 587 603 616 |

† Figures for 2010 may vary from previously published results because of late or amended returns

‡ Gemstones — value only recorded

Value of Production, 2009/2010 and 2010/2011

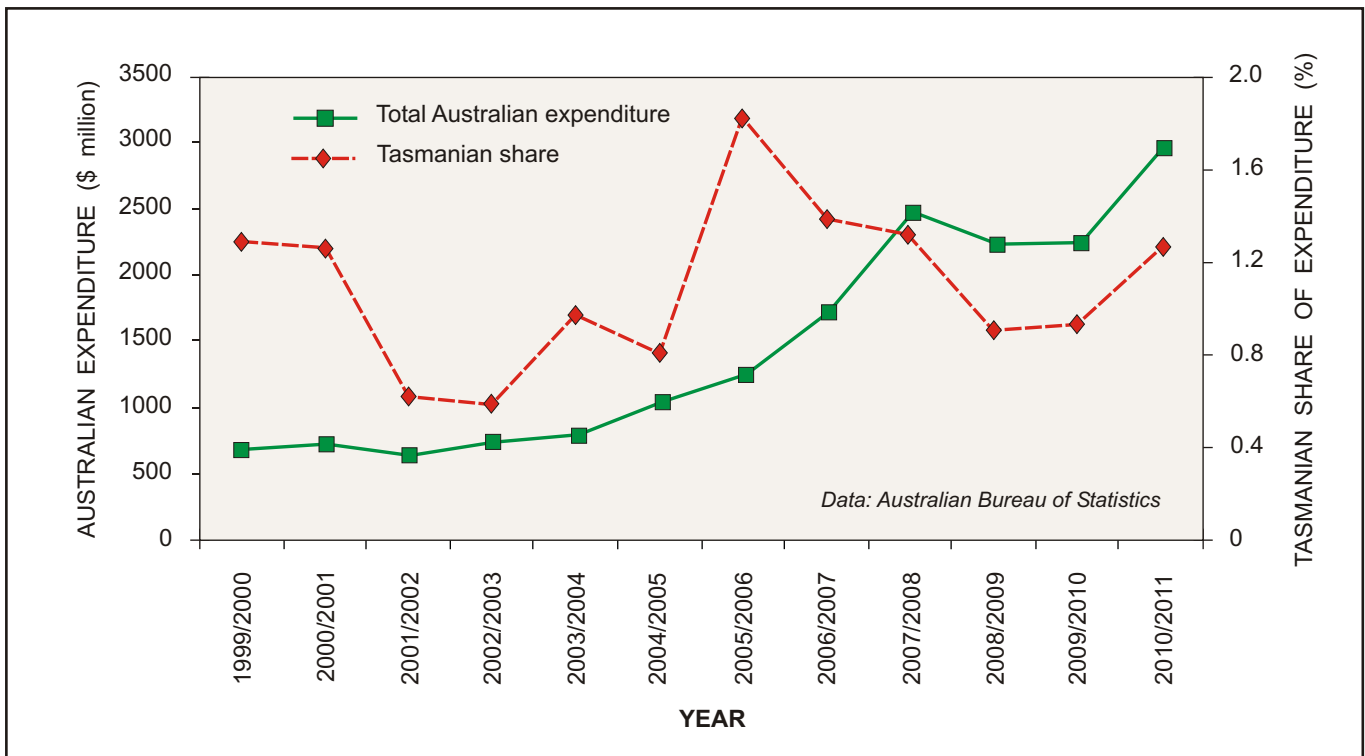
| | 2009/2010 | | 2010/2011 | | % Change |
|--|-----------|------------------|-----------|------------------|--------------|
| | Tonnes | A\$'000 | Tonnes | A\$'000 | |
| Copper | 25 593 | – | 25 135 | – | -1.8 |
| Gold | 47.6 | – | 4.4 | – | -4.3 |
| Iron ore pellets | 2 359 127 | – | 1 840 224 | – | +22.0 |
| Lead | 25 704 | – | 29 058 | – | +13.0 |
| Silver | 87.4 | – | 91.8 | – | +5.0 |
| Tin | 5 956 | – | 5 034 | – | -15.5 |
| Zinc | 83 565 | – | 92 711 | – | +10.9 |
| Total metallic minerals | – | 937 823 | – | 1 105 135 | +17.8 |
| Non-metallic, industrial and fuel minerals | – | 55 873 | – | 46 433 | -16.9 |
| Construction materials | – | 72 201 | – | 75 834 | +5.0 |
| Value added production from Tasmanian and foreign ores | – | 1 304 893 | – | 1 360 202 | +4.2 |
| Value of mining and mineral processing production | – | 2 370 790 | – | 2 587 604 | +9.1 |



Mineral Exploration Expenditure

| Year | Australian Expenditure (\$ million) | Tasmanian Expenditure (\$ million) | Tasmania as % of Australian Expenditure |
|-----------|-------------------------------------|------------------------------------|---|
| 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 |
| 2004/2005 | 1028.4 | 8.3 | 0.81 |
| 2005/2006 | 1240.7 | 22.6 | 1.82 |
| 2006/2007 | 1714.6 | 23.7 | 1.39 |
| 2007/2008 | 2461.4 | 32.4 | 1.32 |
| 2008/2009 | 2223.9 | 20.4 | 0.92 |
| 2009/2010 | 2232.5 | 20.7 | 0.91 |
| 2010/2011 | 2951.3 | 37.3 | 1.26 |

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



REVIEW OF MINERAL SECTOR OPERATIONS

Metallic Minerals

Base Metals

Minerals and Metals Group (MMG) Rosebery mine

MMG operates an underground zinc-lead-copper-gold-silver mine and concentrator at Rosebery. The company employs 268 people, comprising 148 permanent staff, 91 permanent award employees, 21 limited tenure staff (including graduates), four limited tenure award employees, one casual and three part-time employees. A further 244 contractors were involved in various operations.

Mine production

Ore mined for the year totalled 743 781 tonnes grading 12.3% Zn. Production from the mine came from K and W lenses with a small contribution from V lens, which is now depleted. The N lens (located 50 m into the hanging wall of K lens) and P lens have been accessed from the K decline between 50 and 53 levels. No remnant mining from the upper levels occurred.

Mine development

Mine development totalled 4980 metres. This comprised 2362 metres of capital development (179 000 tonnes), 1747 metres of operating ore development (211 000 tonnes) and 870 metres of operating waste development (66 000 tonnes).

Capital development was mined in the 52W exploration drive and extended the W decline to 54W (~1250 m depth). The operating development was mined in K Lens (51–52K levels), W lens (45–46W; 50–54W levels) and N lens (51–53N).

Mill

Mill feed grades were very consistent between the two reporting periods, and there was a slight increase in the tonnes milled. Overall the feed grade was reasonably consistent throughout the reporting period, although grades were lower towards the end of the period reported. The processing plant available operating hours remained constant from last year, but ore supply difficulties in the middle of the reporting period reduced the ore tonnes processed.

Ore treated through the concentrator during the year amounted to 745 870 tonnes, of which 732 300 tonnes were from Rosebery and 13 500 tonnes from outside sources. The overall grade was 12.28% zinc, 3.86% lead, 0.40% copper, 115.64 g/t silver and 1.75 g/t gold.

A total of 11 235 tonnes of Que River and 2320 tonnes of Zeehan Zinc ore were treated through the concentrator

during the year. Processing of both of these ore sources ceased during October 2010.

Production for 2010/2011 comprised:

- Zn flotation concentrate production was 151 196 tonnes for the year with a drop in concentrate grade to 54.96% zinc. The increase in concentrate production is a consequence of an increase in tonnes processed and a drop in concentrate grade.
- Lead concentrate production, at 34 650 tonnes grading 67% Pb, 1022 g/t Ag, increased from that of the previous year, which is a direct consequence of the increase in tonnes processed.
- Copper concentrate production increased to 9895 tonnes grading 19.5% Cu, 6.7% Pb, 3215 g/t Ag, 54.8 g/t Au.
- Doré production was 466 kg, grading 36.35% Ag and 59.3% Au.

Resources and Reserves

Resources and Reserves for the Rosebery mine have been compiled for end of year requirements and are reported using the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* under the code established by the Joint Ore Reserves Committee (2004 edition). Mineral resources quoted are inclusive of the reported ore reserves.

The Rosebery mine lease resource inventory at the end of March 2011 shows an overall increase of 7.2 Mt compared with 2010 resources. The main reasons for the increase are:

- Increase to Measured of 4.11 Mt;
- Decrease to Indicated of 1.69 Mt;
- Increase to Inferred of 3.16 Mt.

The Identified Mineral Resources as at March 2011 comprised:

| Category | Tonnes (000's) | Pb (%) | Zn (%) | Cu (%) | Ag (g/t) | Au (g/t) | Fe (%) |
|------------------------|-------------------|-----------|-----------|-----------|-------------|-------------|-----------|
| <i>Rosebery:</i> | | | | | | | |
| Measured | 8.694 | 3.6 | 12.4 | 0.4 | 128 | 1.8 | 10.3 |
| Indicated | 5.884 | 3.8 | 11.4 | 0.3 | 141 | 1.8 | 8.7 |
| Inferred | 7.834 | 3.9 | 8.7 | 0.2 | 120 | 1.5 | 5.0 |
| Inaccessible | 1.634 | 3.4 | 11.4 | 0.8 | 111 | 2.0 | 15.5 |
| Meas + Ind + Inf | 24.046 | 3.7 | 10.9 | 0.3 | 127 | 1.7 | 8.5 |
| <i>South Hercules:</i> | | | | | | | |
| Measured | 0.977 | 1.5 | 3.1 | 0.1 | 133 | 2.44 | 4.3 |
| <i>Global:</i> | | | | | | | |
| Meas + Ind + Inf | 25.023 | 3.6 | 10.6 | 0.3 | 128 | 1.7 | 8.4 |

Note: Discrepancy may be caused by rounding factors

The Identified Ore Reserves as at March 2011 comprised:

| Category | Tonnes (000's) | Pb (%) | Zn (%) | Cu (%) | Ag (g/t) | Au (g/t) | Fe (%) |
|--------------|-------------------|-------------|--------------|-------------|---------------|-------------|-------------|
| Proved | 3 960 | 3.49 | 11.11 | 0.33 | 124.86 | 1.73 | 7.97 |
| Probable | 2 603 | 3.39 | 8.68 | 0.23 | 137.21 | 1.57 | 4.94 |
| Total | 6 564 | 3.45 | 10.15 | 0.29 | 129.76 | 1.66 | 6.77 |

Total ore reserves at Rosebery have increased by 0.66 million tonnes. Positive changes to the reserve were due to an increase in resource confidence, in particular the N Lens, P lens and Y lens.

Negative changes to the reserves were due to:

- Redesign of the whole mine was undertaken in June 2011, optimising stope and development designs.
- Re-evaluation of extremity of lower K resulted in category change.
- Depletion due to mining;
 - K Lens continued
 - W Lens continued
 - V Lens was completed
 - P Lens was initiated
 - N Lens was initiated (previously K2)
- Mining depletion accounted for a downgrade of 563 kt.

There are no reserves outside of the Rosebery mine.

Rosebery mine lease exploration

Whole-rock lithogeochemical samples were collected from the Mount Black North drill holes for pathfinder studies.

The Mount Black North access track was continued to the north and an additional drill pad was constructed for the continued drilling. Rehabilitation continued on the 2600 mN, 2400 mN and 2200 mN drill pads.

Diamond drilling

Diamond drilling for the year comprised 182 holes drilled for a total of 42 956 metres. The majority of drilling conducted was dedicated to resource infill (19 581 metres) and underground exploration (15 480 metres) for parts of K, P, N, W and Y lenses, and surface exploration (7895 metres) for Z and U lenses. Downtime for the year was significantly less than the previous reporting period.

Surface exploration drilling was conducted to the north and down-dip of current known mineralisation. Project Aegis, a major growth project worth \$22 million, was approved in September 2009 to increase the mine-life well beyond 2020. Surface drilling was focussed on the 2250 mN to test the fertility of host rocks to 80L where current workings are at 53L, and north to 3200 mN. Testing the amenability of the host rocks to mineralisation at this depth provided a revised focus for exploration drilling.

The Aegis project will entail deep drilling from numerous surface and underground locations, including the 48XYO exploration drive, currently being developed, 52W exploration drive finalised in 2010/2011, 53K exploration drive planned for 2011/2012, and the 54X exploration drive

planned for 2012. These drives will provide access to deeper areas in K, W, N, P and X lenses.

Capital expenditure

Total amount expended during 2010/2011 was \$29.4 million, with \$36.88 million planned to be expended during calendar year 2011.

Major projects included the purchase of mobile equipment (\$5.386 million), Bobadil tailings dam works (\$3.119 million), Rosebery ventilation upgrade (\$1.679 million), major housing refurbishment (\$1.571 million), ventilation rises (\$1.339 million) and mill building remedial works (\$1.242 million).

Health & safety

MMG Rosebery Mine recorded one Lost Time Injury (LTI) in 2010/2011. This was an employee who slipped on some stairs and broke his left tibia. The All Injury Frequency Rate (AIFR) 12-month rolling average was 98.6 as at 30 June 2011, similar to that in 2010, although the severity of injuries has dropped and there has been an increase of minor first aid injuries reported such as bumps and bruises, knicks and scratches that indicates a high level of compliance for reporting.

MMG Rosebery Mine originally obtained AS4801 certification in September 2007 and this has been maintained throughout 2010/2011. The Safety Management System has undergone continuous improvement since this time with increased training and awareness on preventative measures such as hazard identification, near-miss reporting and safety interactions from our *Step Up and Save Your Mate* campaign.

The Wellness Program has continued to align with site safety and health initiatives including fatigue management, early intervention, working in heat, daily alcohol testing and continuing our random drug testing program. The program has also continued to increase engagement of employees, contractors and their families to promote a healthier lifestyle.

Environment

MMG Rosebery continued to establish a new environment team in 2010/2011. This will improve current operational environmental management, increase the capacity to undertake environment-related projects and further progress management and rehabilitation of legacy sites with Group Office. The team comprises six positions, with the Environment Manager reporting to the site General Manager.

MMG Rosebery reported three environmental incidents to the Tasmanian Government during the 2010/2011 reporting period, one of these being non-compliant with site licence conditions. These events related to a spillage of lead concentrate on the road and a copper concentrate spill. The non-compliance resulted from an exceedence of the zinc criteria in wastewater discharged at the Bobadil outflow. A number of controls have been implemented to address these incidents and site drainage management continues to be a focus for the operation.

Works continued on the design of a series of stormwater surge ponds which will be installed on site to assist with the control of water during high rainfall events. This will reduce the risk of the site effluent treatment plant overtopping and also reduce the need to stop production during periods of high rainfall. Government approvals for the dams have been received and the project is currently going through the construction tender process. Construction works are scheduled to commence in September 2011.

Other water management activities undertaken include:

- Successful implementation of a production shutdown procedure during high rainfall events to reduce the load on the effluent treatment plant. This was successfully activated a number of times throughout the year and no uncontrolled releases occurred.
- Further diversion of clean stormwater to stop it entering the site and becoming contaminated.
- Increased use of stormwater to replace raw water previously taken from Lake Pieman.
- Development of a water balance model to assist with ongoing improvements in water management.

Visual inspections of the trains prior to leaving MMG Rosebery's mine site indicate that the train wash system, installed in 2009/2010, has proven to be effective in managing dust and potential concentrate being distributed off site. Dust monitoring will continue during 2010/2011 as part of the site Dust Management Plan. A dust suppression system has been designed for the stockpile and rock breaker facilities and is expected to be installed during the 2011/2012 reporting period. Dust monitoring will be undertaken to measure any improvements achieved.

MMG Rosebery's Environmental Protection Notice (EPN) requires the company to monitor noise, air and water quality at a significant number of locations across the site. Historically, the collected data was manually entered into a number of databases, requiring a significant time commitment. In 2010 MMG invested in a new data management system that allows all data from laboratories to be automatically imported to the database. The system automatically highlights predetermined exceedences, allowing the environment team to identify and manage issues as they occur. All historic data has now been migrated to the new database. All monitoring as required by the EPN was undertaken during the 2010/2011 reporting period.

Construction of a wall lift commenced at the Bobadil tailings storage facility (TSF) (Stage 7b/c) in April. The lift will take the crest from RL193 m to RL195 m and is scheduled for completion in the first quarter of 2012. A review of the capacity of the facility was undertaken in 2011. The findings of the review currently project that the TSF will reach a final crest level of RL198 m and reach capacity in 2017. An investigation into future tailings storage options is currently underway.

In order to treat water from the test pit at South Hercules a waste water treatment plant (WTP) was installed using new technology and a product called viromine. The addition of viromine is used to bring the water being treated within

acceptable pH limits prior to discharging to Bakers Creek, as per the EPN criteria. The WTP is due to be commissioned in August 2011 and monitoring results indicate compliance with all EPN licence conditions except total suspended solids (TSS) resulting from the naturally high clay content in the groundwater. A sand filter is due to be installed in September 2011 which will filter out the suspended solids. In the interim a silt trap is being installed to pre-treat the pit water prior to treatment in the WTP.

MMG Rosebery underwent two surveillance audits for its ISO14001 environmental management system in 2010/2011 and continues to maintain its certification.

Community Relations

Lead in the community

A final report back to the community in regard to the Rosebery Environmental Sampling Program was held on 29 July 2010. Representatives from MMG, Environment Protection Agency (EPA) and the Department of Health and Human services (DHHS) spoke to community members.

From the work carried out, MMG is confident that there is no evidence of harm to human health from the presence of heavy metals in Rosebery.

MMG continues to provide Rosebery residents with further confidence in relation to the mine's environmental impact by:

- Working with the EPA on further improving its air monitoring regime at Rosebery;
- Working with the DHHS to ensure that Rosebery residents know what precautions to take as part of living in a mining town;
- Improving its communication and engagement with the Rosebery community around this issue;
- Providing blood tests free of charge to residents that request them; and
- Continuing to run its community blood testing program to build on the good work conducted by MMG and the Menzies Centre in the past.

MMG has committed significant resources to establishing the facts and increasing the level of information available to members of the Rosebery community on this issue. This is part of MMG's commitment to the town of Rosebery and its desire to remain part of the community for a long time.

75 years of Continuous Mining and Milling celebrations

In February 2011 the Rosebery mine celebrated 75 years of continuous mining and milling. Functions held during the week included employee and contractor spit roast meals and presentation of a commemorative watch; unveiling of a plaque by a family member of founder Tom McDonald, and opening of an interpretive sign of the MMG surface area; a cocktail party for local business leaders, state and federal politicians, senior management of MMG and other industry representatives; a mine open day; presentation of a commemorative medallion to every school child in Rosebery; and the MMG Rosebery Festival.

Community Liaison Office

In the last quarter of 2010 MMG opened a Community Liaison Office in the Main Street of Rosebery. The office is open daily and allows residents of the community and visitors to deal face to face with personnel from MMG. The office has information regarding the mine on display and other relevant information for living in a mining community. The office is also available to the community for meetings and workshops.

Other activities

MMG Rosebery hosted a range of local, interstate and international visitors, runs a service award program and provides quarterly updates to the community.

Bass Metals Limited Que River and Hellyer

Mining

As planned, open-cut mining at Que River ceased in October 2010 with the exhaustion of reserves. The operation was highly profitable over its three-year mine life. During the year 8452 tonnes of ore with a head grade of 13.5% zinc, 7.7% lead, 0.71% copper, 241 g/t silver and 3.9 g/t gold were produced. Total waste (PAF and NAF) mined and stripped at Que River from July 2010 to June 2011 amounted to 17 880 m³. The mine remains on care and maintenance and at the end of the period, rehabilitation work was almost completed.

Mine development intersected the Fossey deposit in the December quarter and stoping ore production commenced in March. During the year 157 109 tonnes of ore grading 7.6% zinc, 4.1% lead, 0.25% copper, 113 g/t silver and 1.9 g/t gold were produced.

Ore treated totalled 130 130 tonnes yielding 10 049 tonnes of zinc concentrate with a grade of 48% zinc, 153 g/t silver and 1.1 g/t gold, and 4252 tonnes of lead concentrate containing 51% lead, 738 g/t silver and 2.6 g/t gold. A further 499 tonnes of a copper-precious metals concentrate with a grade of 17% copper, 11% lead, 6205 g/t silver and 11.8 g/t gold were also produced.

Fossey underground waste mined or stripped in 2010/2011 totalled 152 764 tonnes. This comprised all waste including development and other underground waste mining.

The operation was adversely impacted by a water inflow and lower than anticipated zinc and lead grades towards the end of the year. Detailed infill drilling enabled a revised resource estimated to be completed.

Reserves and Resources

Ore reserves for the Fossey deposit, exclusive of stockpiles, as at 30 June 2011 were:

| JORC Classification | Tonnes (million) | Copper (%) | Lead (%) | Zinc (%) | Silver (g/t) | Gold (g/t) |
|---------------------|------------------|------------|------------|-------------|--------------|------------|
| Proved | 269 | 0.5 | 6.7 | 12.9 | 123 | 2.6 |
| Probable | 170 | 0.2 | 3.4 | 5.6 | 71 | 1.5 |
| Total | 439 | 0.4 | 5.4 | 10.1 | 103 | 2.2 |

Resources at a 5% combined zinc and lead cut-off grade at 30 June 2011 are shown below. The cut-off for Mount Charter is 0.7 g/t gold.

| JORC Classification | Tonnes ('000) | Copper (%) | Lead (%) | Zinc (%) | Silver (g/t) | Gold (g/t) |
|------------------------------|---------------|------------|------------|-------------|--------------|------------|
| <i>Fossey</i> | | | | | | |
| Measured | 286 | 0.6 | 7.4 | 14.2 | 137 | 2.9 |
| Indicated | 108 | 0.4 | 6.8 | 11.0 | 120 | 1.8 |
| Inferred | 66 | 0.3 | 4.7 | 8.4 | 94 | 2.1 |
| Total | 460 | 0.5 | 6.9 | 12.6 | 127 | 2.5 |
| <i>Fossey East</i> | | | | | | |
| Indicated | 140 | 0.5 | 5.2 | 11.0 | 83 | 1.9 |
| Inferred | 110 | 0.3 | 3.3 | 6.6 | 60 | 1.7 |
| Total | 250 | 0.4 | 4.4 | 9.1 | 73 | 1.8 |
| <i>Hellyer Remnants</i> | | | | | | |
| Indicated | 640 | 0.4 | 4 | 6.8 | 83 | 1.3 |
| Inferred | 110 | 0.2 | 4.9 | 8.1 | 107 | 1.5 |
| Total | 750 | 0.3 | 4.1 | 7 | 87 | 1.3 |
| <i>Que River base metals</i> | | | | | | |
| Indicated | 160 | 0.2 | 3.8 | 6.5 | 96 | 1.2 |
| Inferred | 140 | 0.3 | 4.2 | 7.4 | 104 | 1.2 |
| Total | 300 | 0.2 | 4 | 6.9 | 100 | 1.2 |
| <i>Que River S lens</i> | | | | | | |
| Measured | 60 | 1.7 | 0.7 | 2.1 | 69 | 0.3 |
| Indicated | 260 | 1.9 | 1.6 | 4.3 | 68 | 0.3 |
| Inferred | 60 | 2.5 | 0.2 | 0.6 | 33 | 0.15 |
| Total | 380 | 2.0 | 1.3 | 3.4 | 63 | 0.3 |
| <i>Hellyer tailings</i> | | | | | | |
| Measured | 4900 | 3.1 | 2.8 | 0.2 | 105 | 2.7 |
| Indicated | 2500 | 3.0 | 2.6 | 0.2 | 104 | 2.6 |
| Inferred | 2100 | 2.9 | 1.7 | 0.2 | 103 | 2.4 |
| Total | 9500 | 3.0 | 2.5 | 0.2 | 104 | 2.6 |
| <i>Mount Charter</i> | | | | | | |
| Indicated | 1900 | | | 0.7 | 36 | 1.2 |
| Inferred | 4200 | | | 0.4 | 35 | 1.2 |
| Total | 6100 | | | 0.5 | 36 | 1.2 |

Employment

A total of 174 persons were employed at year end, comprising 19 direct employees and 155 contractors. These worked in administration and management (9), exploration (24), processing (39) and mining (102).

Rehabilitation, environmental and pollution control initiatives

During the year the company commenced a care and maintenance type rehabilitation program at its Que River mine site. Around the Hellyer site, in particular the Hellyer Tailings Storage Facility (TSF), Bass Metals initiated the installation of an automated process system to monitor and treat contaminated water run-off into the TSF. An overall improving trend in the quality of water outflows has been achieved and further improvements are expected once the automated system is fully commissioned.

Capital expenditure and new developments

The Hellyer Mine Project (HMP) is a new development with ore sourced from the newly developed Fossey underground mine and processed on a campaign basis at the Hellyer flotation concentrator to produce zinc, lead and copper-precious metals concentrates. Development of the HMP commenced in early 2010 with the start of decline development into the Fossey deposit and refurbishment of the Hellyer plant. Mine development intersected the Fossey ore body in December 2010, and stoping ore production

commenced in March 2011. The first milling campaign and concentrate production occurred in February 2011 from development ore, and first zinc concentrate sales were also achieved in February 2011.

Capital expenditure during the year totalled \$29.825 million. This comprised \$22.404 million on the mine properties, \$4.057 million on plant and equipment, and \$3.363 million on exploration expenditure.

Copper

Copper Mines of Tasmania Pty Ltd Mount Lyell mine

Copper Mines of Tasmania employs 323 people comprising 99 salary and wage employees and 204 contractors.

Production

Ore mined totalled 1 884 984 tonnes at an average grade of 1.29% Cu. The mill processed 1 894 915 tonnes of ore and produced 82 286 tonnes of dry concentrate, which contained 22 227 tonnes of copper metal. Waste mined totalled 39 215 tonnes.

Reserves and Resources

The Prince Lyell 1415–1315 ore Reserve as at 31 March 2011 (0.8% Cu cut-off grade) comprised:

| Classification | Ore (Mt) | Cu (%) | Au (g/t) | Cu metal ('000 t) |
|--------------------------------------|------------|-------------|-------------|-------------------|
| Proved reserve (surf stockpile) | 0.0 | 1.25 | 0.31 | 0 |
| Proved reserve (recovered in situ) | 3.0 | 1.34 | 0.33 | 40 |
| Probable reserve (recovered in situ) | 0.8 | 1.31 | 0.32 | 10 |
| Probable reserve (from cave) | 6.0 | 1.13 | 0.28 | 68 |
| Proved | 3.0 | 1.34 | 0.33 | 40 |
| Probable | 6.7 | 1.15 | 0.29 | 77 |
| Total reserve | 9.7 | 1.21 | 0.30 | 118 |

Total estimated mineral resources at 31 March 2011, using a 0.8% Cu cut-off grade for Prince Lyell and 0.9% Cu cut-off for Western Tharsis (resources are in addition of reserves) comprised:

| Resource description | Ore (Mt) | Cu (%) | Au (g/t) | Cu metal ('000 t) |
|---|-------------|-------------|------------|-------------------|
| Prince Lyell below 1315 (Inferred) | 6.1 | 1.17 | 0.29 | 71 |
| Prince Lyell–Cave 2092–1415 (Indicated) | 0.1 | 1.14 | 0.28 | 1 |
| Prince Lyell–Cave 2092–1415 (Inferred) | 9.4 | 0.87 | 0.22 | 82 |
| Western Tharsis (Indicated) | 4.0 | 1.23 | 0.30 | 49 |
| Western Tharsis (Inferred) | 8.6 | 1.26 | 0.31 | 108 |
| All resources (Ind. and Ind.) | 28.2 | 1.11 | 0.3 | 311 |

Other

The company achieved an excellent safety record through the year with a Lost Time Injury Frequency Rate (LTIFR) of 3.8, with one LTI. On 8 June 2011 the Fossey project recorded 500 days LTI free. This is a reflection of the commitment from crews and staff towards maintaining a safe working environment and is an excellent outcome given some of the difficult operation conditions and extreme weather events experienced during the year.

Environmental

Copper Mines of Tasmania has continued with its environmental improvement program. The legacy of an old site designed to drain direct to the river has been a challenge. Ongoing pollution reduction projects have included:

- Improved stormwater treatment and monitoring of environmental dust.
- Increased recycling of process water and waste materials and investigation into sustainable waste management practices continue.
- Environmental hazard reduction projects have included improved tailings and concentrate pipeline containment, especially at environmentally critical stream crossings.
- The tailings storage facility has been expanded during the year.

Biodiversity conservation projects completed include feral animal and weed control programs.

Copper Mines of Tasmania is actively involved with a variety of community environmental groups, including the Queenstown Landcare Group and the West Coast Weed and Fire Management Group, and has been awarded recognition in the Tidy Towns program. Copper Mines of Tasmania has continued to assist the State with its program to treat acid drainage from historic Mount Lyell mining activities.

Capital expenditure

A total of \$14.6 million was spent during the year. The most significant projects included \$3.8 million on a tailings dam lift and \$8.4 million on mine development/infrastructure.

Gold

BCD Resources NL Tasmania mine, Beaconsfield

Ore production at the Beaconsfield mine increased marginally to 297 845 tonnes, but the gold grade of 6.0 grams per tonne was 17% lower than the previous year, due to the availability of only lower grade sections of the mine.

A record 297 578 tonnes of ore were treated. Gold recovery was 46 460 ounces, a 20% decrease on the previous year.

Development of the higher grade Western Zone continued during the year and a significant increase in grade is anticipated when this material is accessed. The economic performance of the operation will also be enhanced by the introduction of the more efficient radial in reef mining method.

A number of cost reduction measures were implemented during the year. These included closure of the Melbourne corporate office and relocation to Beaconsfield, staff reductions, a change to contract mining, suspension of non-essential exploration, reduction of on-site services, review of insurance costs and sale of excess equipment.

Resources and Reserves

Resources and reserves declined substantially during the year and as at 30 June 2011 comprised:

| | |
|-----------------------|---------------------------------------|
| Measured Resource | 262 000 tonnes @ 11.5 g/t Au |
| Indicated Resource | 430 000 tonnes @ 11.1 g/t Au |
| Inferred Resource | 319 000 tonnes @ 8.4 g/t Au |
| Total Resource | 1 011 000 tonnes @ 10.4 g/t Au |
| Proved Reserve | 137 000 tonnes @ 8.6 g/t Au |
| Probable Reserve | 139 000 tonnes @ 10.6 g/t Au |
| Total Reserve | 276 000 tonnes @ 9.6 g/t Au |

Unity Mining Limited Henty gold mine

Unity Mining operates the Henty gold mine and gold doré plant in western Tasmania. The company is strongly focussed on growth and particularly with the Henty mine and associated exploration licences, exploring the potential to extend the existing mine life.

Production

During the year 254 045 tonnes of ore were mined, with a head grade of 4.7 g/t gold.

A total of 254 106 tonnes of ore was milled with gold doré, containing 1129 kg gold and 740 kg silver, being produced. Waste mined totalled 125 316 tonnes.

Employment

A total of 210 people, comprising 106 employees and 104 contractors, were employed in the operation. Of these 81 were employed in mining, 24 in processing and 105 in support services.

Resources and Reserves

Resources and Reserves as at 30 June 2011 comprised:

| | |
|-----------------------|--------------------------------------|
| Measured Resource | 590 000 tonnes @ 6.0 g/t Au |
| Indicated Resource | 620 000 tonnes @ 5.2 g/t Au |
| Inferred Resource | 200 000 tonnes @ 5.4 g/t Au |
| Total Resource | 1 410 000 tonnes @ 5.6 g/t Au |
| Proved Reserve | 350 000 tonnes @ 6.0 g/t Au |
| Probable Reserve | 250 000 tonnes @ 5.0 g/t Au |
| Total Reserve | 600 000 tonnes @ 5.6 g/t Au |

Unity has also announced an Inferred Resource of 750 000 tonnes of 2.8 g/t gold at the Lakeside deposit, south of Tullah, which lies within Exploration Licence 34/2010, held by the company.

Rehabilitation, environmental and pollution control initiatives

There was a continued increase in production and exploration activity at the Henty gold mine during 2010/2011, which has resulted in an increase in the volumes of waste generated. Ensuring that these waste streams are appropriately managed has been a significant focus for all personnel on site.

Given that all waste generated on site (other than tailings) has to be transported off site for recycling/disposal/further treatment, there is a financial as well as environmental benefit to minimising waste generation on site.

Ongoing support has been provided to the exploration team in managing their programs, both on the mining lease and on the exploration leases. The drilling contractor engaged for all surface drilling during the year has demonstrated excellent commitment to the mine's vision of minimising environmental impacts in all aspects of operation. Recognition has been provided to the contractor for a number of introduced initiatives in both environmental and health and safety management, including their management of sump flows on surface drill pads.

An embankment raise of the Newton Tailings Storage Facility was undertaken in early 2011. This 2.5 m lift is the last scheduled lift for this facility, and will provide storage capacity for tailings generated for the next three years at current plant throughput rates. Inclement weather conditions caused some delays in the work program, but the work was completed with no significant environmental or health/safety incident recorded. This achievement is due in no small part to the management systems employed by the contractor involved in the project, and they have been commended for their work in this area.

Capital expenditure

A total of \$20.714 million was expended during 2010/2011. This consisted of:

- \$10.039 million on exploration and development geology and on-lease exploration, particularly near existing mine infrastructure for mine life extensions;
- \$9.208 million was spent on mine development costs; and
- \$1.467 million on the embankment lift at the tailings facility.

Iron ore

Grange Resources Limited Savage River mine

Grange Resources operates a magnetite mine and concentration plant at Savage River. Magnetite concentrate is pumped as a slurry to Port Latta, where it is converted to iron ore pellets and shipped to market.

A total of 1 337 735 tonnes of ore was mined, 1 908 801 tonnes of magnetite concentrate produced, and 1 842 224 tonnes of iron ore pellets produced. Shipments totalled 1 902 205 tonnes of pellets and 18 297 tonnes of concentrate. Despite lower grade alternative ore having to be sourced, production of pellets remained strong and the operation was highly profitable.

During the year, work continued to cut back the eastern wall of the North pit, affected by the June 2010 rock slide. This was progressing satisfactorily, with access expected to be re-established by late 2011.

Ore Reserves and Resources

Mineral resources as at 30 June 2011 were:

| Category | Million tonnes | Grade (% recoverable magnetite) |
|--------------|----------------|---------------------------------|
| Measured | 81.4 | 53.8 |
| Indicated | 131.5 | 53.5 |
| Inferred | 86.9 | 48.9 |
| Total | 299.8 | 52.3 |

The ore reserve at 30 June 2011 was:

| Category | Million tonnes | Grade (% recoverable magnetite) |
|--------------|----------------|---------------------------------|
| Proved | 47.6 | 51.6 |
| Probable | 66.3 | 51.4 |
| Total | 113.9 | 51.5 |

Tasmania Mines Limited Kara mine

Tasmania Mines operates the Kara No. 1 and Eastern Ridge open-cut mines and a processing plant southeast of Hampshire in northwest Tasmania. The operation is scheduled to produce up to 500 000 tonnes of magnetite concentrate from a northerly-plunging synclinal skarn-style mineralised deposit with mining operations proceeding from south to north and becoming gradually deeper. Scheelite concentrate is produced as a by-product of the magnetite mining and processing operations.

The Kara No. 1 open cut contains up to 19.5 years of Proved and Probable reserves at a scaled annual production rate of 250 000 tonnes of magnetite ore per year, progressively ramping up to 800 000 tonnes. Additional target resources have been indicated by previous exploration drilling programs to the north of the current reserves. Tasmania Mines continues the process of preparing the Kara North open cut for production in 2012.

Production

A total of 250 000 tonnes of magnetite ore was mined with a nominal grade of 54% Fe₃O₄, with 255 750 tonnes of ore being fed to the mill. A total of 13 500 tonnes of dense medium magnetite (DMM) concentrate was produced at a nominal grade of 68% Fe₃O₄, with 41 000 kilograms of scheelite concentrate being produced from the ore treated.

A total of 1 261 656 tonnes of waste material was removed from the open cut. Of this a sizeable component consists of old overburden and tailings material to the north of the operating pit and weathered granite from the western pit wall. Most of the waste material was placed on three waste storage dumps, with some being used on the new tailings storage facility with smaller quantities used on roads and other rehabilitation projects around the site.

Resources and reserves

In situ resources as at 30 June 2011, at a cut-off grade of 30% FeO, are:

| Category | Tonnes | FeO (%) | Fe ₃ O ₄ (%) | WO ₃ (g/t) | Sn (g/t) |
|--------------|-------------------|-------------|------------------------------------|-----------------------|------------|
| Measured | 2 170 000 | 47.0 | 50.5 | 1416 | 550 |
| Indicated | 7 110 000 | 47.4 | 50.9 | 620 | 760 |
| Inferred | 9 300 000 | 48.2 | 51.8 | 203 | 754 |
| Total | 18 580 000 | 47.7 | 51.2 | 504 | 733 |

The total mineable resource is 13 854 646 tonnes of 52.4% Fe₃O₄, 451 g/t WO₃ and 701 g/t Sn.

The mining reserves, also at a 30% FeO cut-off grade, are:

| Category | Tonnes | FeO (%) | Fe ₃ O ₄ (%) | WO ₃ (g/t) | Sn (g/t) |
|--------------|-------------------|-------------|------------------------------------|-----------------------|------------|
| Proved | 8 639 132 | 43.1 | 46.3 | 209 | 629 |
| Probable | 6 163 222 | 40.8 | 43.8 | 634 | 565 |
| Total | 14 802 354 | 42.1 | 45.2 | 386 | 603 |

Other deposits and exploration

The Eastern Ridge deposit is the northeastern extension of the Kara No. 1 ore body. The deposit was explored for scheelite in the past and there is no estimate of the magnetite content. A drill program is under review to produce a JORC compliant resource.

Location 5 is a wholly underground scheelite deposit contained within high grade magnetite about 1.5 kilometres north of Eastern Ridge. The Eastern Ridge to Location 5 line of lode represents a continuous line of scheelite enrichment along two kilometres of strike on the upturned eastern limb of the host deposit. It is planned to review available data and produce a JORC compliant statement for the drilled section of the deposit.

Kara 266 is a satellite deposit containing high grade scheelite pods within magnetite skarn about 750 metres north of the northern limit of the Kara No. 1 pit. Past estimates are that the deposit contains up to 400 000 tonnes of scheelite-bearing material at 0.95% WO₃, hosted within 700 000 to 750 000 tonnes of magnetite-bearing material at 36.6% Fe₃O₄. Tasmania Mines has completed

environmental works and commenced overburden stripping at the deposit, with planned initial production in 2012.

A magnetite host ore body to the west of and below the Emu River, east of the Kara 266 North deposit, has been located on a single drill section by an earlier drill campaign. The deposit did not represent a scheelite target at the time of the drill program and was not followed up. An exploration drill program during late 2011 and early 2012 will be conducted to attempt to raise this deposit to Inferred Resource status.

Employment

Sixteen full time and two part time operational and administrative staff are employed by the company, with 14 to 20 earthmoving and maintenance contractors engaged on a near continuous basis. Drilling, surveying, geological, metallurgical, mining and civil engineering, and environmental consultants and contractors are engaged on an as-needs basis.

Rehabilitation, environmental initiatives and pollution control initiatives and projects

All rehabilitation, environment and pollution control objectives are achieved by adherence to the 2009 Environmental Management Plan. A specific objective has been the rehabilitation of old tailings and overburden dumps and development of an in-pit waste (overburden) management strategy.

Two watercourses have been effectively re-directed during the year and a containment bund developed around the new Kara North open cut site.

Two permanent waste storage dumps have been completed and have been permanently closed. Waste dump WSF3, surrounding the mill wetland, has been profiled, covered with topsoil and is ready for seeding whilst the WSF2 dump is in the process of being profiled before being covered with topsoil. A new permanent waste storage site on the east side of the site is currently in use until the in-pit waste dump can be restarted.

Construction of a new tailings dam, with sufficient capacity to accommodate tailings storage from the known reserves, continues. The new dam is adjacent to and within the same drainage pattern as the existing tailings storage. Completion of the planning and implementation of the tailings storage facility is the most significant project on site for Tasmania Mines at this time.

The Kara North 266 site has been cleared of vegetation, environmental works completed and overburden stripping commenced. Production is expected to commence in 2012. The deposit is an extension of the Kara No. 1 ore body with similar mineralisation but higher scheelite content. All access to the area is in place and existing plant and tailings storage facilities are to be utilised to mine the deposit. It is intended that waste and overburden from both Kara North and Kara No. 1 will be used to return the profile to its original state following the completion of mining at Kara North.

Capital expenditure

Capital expenditure to June 2011 totalled \$4.3 million and included expenditure on plant and equipment (\$1.243 million), flotation (\$0.848 million), new mill (\$1,051 million) and tailings dam (\$1,162 million).

Further capital spending on the tailings dam, scheelite flotation plant and processing plant is planned.

New developments

Tasmania Mines has targeted coal wash and specialist magnetite product markets in recent years. In future Tasmania Mines also intends to produce a steel making concentrate which will ensure the most effective method of utilising the mineral deposit by ensuring that lower grade and oxidised ore will be fully utilised.

Overburden stripping will continue at the Kara North 266 open cut site and initial production of scheelite and oxidised ore should commence during 2012.

Tin

Bluestone Mines Tasmania Pty Ltd Renison Bell and Mount Bischoff

The Renison and Mount Bischoff mines are owned by a 50/50 joint venture (BMTJV) between the operator, Bluestone Mines Tasmania Pty Ltd (a wholly-owned subsidiary of Metals X Limited), and Yunnan Tin Parksong Australia Holdings Pty Limited. The mines operated profitably during the year with revenue in excess of \$138 million.

A total of 472 076 tonnes of ore grading 1.61% tin was produced at Renison Bell. Open-cut mining at Mount Bischoff ended in July with 6690 tonnes of ore at 0.99% tin being produced before the mine was placed under care and maintenance. Ore treated totalled 472 076 tonnes with a head grade of 1.56% tin, with concentrates containing 5402 tonnes of tin at a recovery rate of 66% being produced. During the year a copper circuit was commissioned for the first time in the mine's history and 188 tonnes of copper in concentrate with significant silver credits were produced.

Significant investment in exploration at Renison resulted in increases in reserves and resources during the year, a highlight being upgrading the resource in the Area 4 zone at depth in the northern end of the mine to 1.33 million tonnes at 1.9% tin. A new lode, Mawson's, was discovered at intermediate depth in the northern section.

Options for further open-cut and underground mining at Mount Bischoff are being considered and the BMTJV is undertaking a review of geophysical data to generate new targets.

Tungsten

King Island Scheelite Limited Grassy

King Island Scheelite Limited continues to progress development plans for the scheelite resources on King Island. The Dolphin Project is focussed on redeveloping the original scheelite mine, with the resource comprising remnant ore bodies at Dolphin, Bold Head and tailings. The company has recalculated resources for a higher grade underground mining operation instead of the expanded open

Resources and reserves

Resources at Renison as at 30 June 2011 comprised:

| | tonnes | % tin | tonnes | % copper |
|--------------|------------------|-------------|------------------|-------------|
| Measured | 917 000 | 2.01 | 479 000 | 0.28 |
| Indicated | 4 260 000 | 1.52 | 2 995 000 | 0.39 |
| Inferred | 3 177 000 | 1.66 | 1 242 000 | 0.36 |
| Total | 8 354 000 | 1.63 | 4 716 000 | 0.37 |

Resources at Mount Bischoff comprised 968 000 tonnes at 0.59% tin in the Indicated category and 699 000 tonnes at 0.47% tin in the Inferred category for a total of 1 667 000 tonnes at 0.54% tin.

Reserves at Renison as at 30 June 2011 comprised:

| | tonnes | % tin | tonnes | % copper |
|--------------|------------------|-------------|------------------|-------------|
| Proved | 378 000 | 1.67 | 376 000 | 0.13 |
| Probable | 2 230 | 1.39 | 1 541 000 | 0.29 |
| Total | 2 608 000 | 1.43 | 1 918 000 | 0.26 |

The North Renison decline was dewatered and refurbished during the year to allow access to the upper parts of the Zeehan ore body, with a view to resuming mining in the higher grade northern section in late 2012.

The resource in the tailings dams at 30 June was 19.055 million tonnes of 0.44% tin and 0.21% copper, all in the Measured category. The tailings dam reserve stood at 18.664 million tonnes of 0.44% tin and 0.21% copper, all in the Probable category. The BMTJV worked on validating the results of the Definitive Feasibility Study on the Rentails project in preparation to committing to implementation..

cut originally envisaged, with the initial redevelopment plan involving reopening the former underground mine at Dolphin and constructing a processing facility to produce approximately 3500 tonnes of WO₃ concentrate per year. The company plans to resume production in late 2012 with the treatment of tailings to recover a scheelite concentrate, with underground ore production from the Dolphin mine expected to start in early 2014. The potential to reopen the nearby Bold Head mine and incorporate additional down-plunge tonnes at Dolphin will further improve returns.

Fuel Minerals

■ Cornwall Coal Company NL

Production

Production of raw coal for 2010/2011 totalled 547 106 tonnes. This coal was sourced from the Duncan (225 588 tonnes), Cullenswood (118 787 tonnes), Blackwood 4 (100 993 tonnes) and Kimbolton (101 739 tonnes) mines.

Washery throughput of raw coal totalled 551 942 tonnes to produce 325 072 tonnes of saleable coal at a washery yield of 58.90%. Coal sales totalled 380 880 tonnes.

A total of 226 870 tonnes of reject materials were deposited at the Duncan reject dump.

Development

Duncan Colliery

Production continued throughout the year using bord and pillar techniques. The Miniwall system was disposed of due to its failure to perform at Duncan.

Duncan is nearing the end of its economic life but due to the delays in starting Blackwood 4 the mine will be going into previously unworked areas of low yield to extend its life until the end of 2012.

Blackwood Colliery No. 4 Entry

The Blackwood development continued towards the north with variable mining conditions. Development utilised CM06, a wide-head continuous miner with on-board mining rigs.

Following significant rain events in March, several landslides occurred in the area of the Blackwood amenities leading to a decision to relocate the amenities area to a less landslide-prone area. The relocation will occur in 2011/2012.

Huntsman No. 2 open cut

The mine has been re-activated with production likely in November 2011. The rehabilitation of the past mining area will progressively continue as mining occurs.

Cullenswood open cut

The Cullenswood #2 open-cut mine was established as coal in the original Cullenswood mine was exhausted. Final rehabilitation of Cullenswood will be completed during 2011/2012.

An application was lodged to extend the lease area to access coal to the north of the existing Cullenswood lease.

Coal was produced from the Cullenswood area throughout the period using contractors to remove overburden and stockpile the coal on site prior to transport to the Fingal washery. The Cullenswood reserve is being used to augment the supply from the underground mines and blended to satisfy customer quality requirements.

Kimbolton Coal

Mining of blocks at Kimbolton continued during the year. The mining sequence and supply arrangement means that

the removal of overburden and coal occurs in stages. Coal is transported from Kimbolton to the Fingal washery for washing.

The distance between the Fingal and Kimbolton sites renders the transport of the raw product, together with the cost of production, uneconomic unless combined with a backload arrangement to a customer in the area.

Exploration

Mt Nicholas

A total of twelve holes were drilled during January and February 2011, mainly on the northern side of Mt Nicholas in the Huntsman area. The cores were logged and the coal seams analysed with float sink analysis and the floats sent to a NATA-registered laboratory.

Duncan

One hole was drilled on the eastern side of an igneous intrusion to determine future potential for open-cut operations.

Capital Expenditure

A total of \$1.3 million was spent on capital during the reporting period. \$1.1 million was spent on new/refurbished mining equipment with a further \$0.2 million spent on resource definition.

Rehabilitation

The Huntsman and Blackwood 2 and 3 areas continued to be monitored throughout the year.

Employment

Employment totalled 81 people, with 59 working underground, 12 in processing and 11 in administration.

A further 22 contractors were employed in coal cartage (10), open-cut operations (8) and apprentices (4).

Safety

Three lost time injuries occurred during the period.

- An underground employee strained his back whilst assisting other employees to lift a continuous miner trailing cable.
- An underground employee suffered a fractured shoulder blade when a piece of stone fell from the roof striking him on his shoulder.
- An employee was bitten by a caterpillar which was in his boot. He suffered an allergic reaction and was taken to hospital due to swelling.

The Department of Justice conducted regular audits of the underground and washery operations.

Cornwall Coal hosted the annual Tasmanian Mines Rescue Competition, with seven teams competing in this year's event. Cornwall Coal was the overall winner and Leigh Spilsbury was awarded Best Captain for the fifth year in a row.

Industrial Minerals and Construction Materials

Beams Brothers

| | |
|-------------------------------|--|
| <i>Current mining leases:</i> | Cressy, Flowery Gully and Badger Head Road |
| <i>Total area</i> | 515 hectares |
| <i>Regions</i> | Northern Tasmania |
| <i>Total production</i> | 54 903 tonnes metallurgical grade limestone and dolomite 21 447 tonnes lime and limestone drains 66 957 tonnes fine limestone and dolomite 2696 tonnes dolomite by-product 7834 tonnes limestone mixing stone 49 300 tonnes ironstone |
| <i>Overburden stripped</i> | 32 000 m ³ Flowery Gully, 12 000 m ³ Cressy |
| <i>Number of employees</i> | 28 employees, including office staff |

Rehabilitation works at Flowery Gully included planting of boundary trees to provide a visual screen and improve visual amenity, along with progressive clean-up across the site. Rehabilitation works at Cressy included re-contouring of the waste dump site and spreading topsoil. The planting of trees and grasses is scheduled to follow.

Major projects included replacement of the old electric shed to re-house the new control system, new safety key lockout system on VSI crushing stations, and setting up of a tertiary screen at the iron ore plant. In addition to these projects, plant upgrades have included an upgraded 3.1 m³ loader and late model 30 tonne 6 6 dump truck.

BIS Industrial Logistics

| | |
|------------------------------|--|
| <i>Current mining leases</i> | Perth, Ridgley, Birrallee, Frankford, Melrose, Sprent, St Helens, Stieglitz, Argonaut, Weldborough, Tebrakunna, Basin Creek and Wattle Creek |
| <i>Total area</i> | 413 hectares |
| <i>Regions</i> | Statewide |
| <i>Total production</i> | 89 000 tonnes from basalt and quartz sand 560 000 tonnes from basalt, quartz and conglomerate |
| <i>Overburden stripped</i> | 25 000 m ³ |
| <i>Number of employees</i> | 33 staff including contractors |

The company's recent acquisition of additional mining leases has increased their operational capacity to approximately one million tonnes per annum. The crushed and screened products are supplied to local councils, asphalt/sealing contractors, ready-mix concrete suppliers, mining operations and the general public.

Ongoing progressive rehabilitation continued at all sites across Tasmania with major improvements controlling weed infestation through rigorous weed management plans.

An increase in licence capacity resulted in \$250,000 being invested on the mining lease at Melrose for increased water catchment for settlement and upgrading of the road intersection to the quarry. A further \$100,000 was spent on safety upgrades across several sites.

Boral Construction Materials Group (Tasmania) Limited

| | |
|------------------------------|--|
| <i>Current mining leases</i> | Andersons Creek, Boomer Hills, Beaconsfield, Cabbage Tree Hill, Launceston, York Town, Nook, Bridgewater, Soldier Settlement Road, South Arm |
| <i>Total area</i> | 733 hectares |
| <i>Regions</i> | Flowery Gully, Launceston, Hobart, South Arm and Nook |
| <i>Total production</i> | 728 000 tonnes road base 523 000 tonnes concrete and sealing aggregates 50 000 tonnes sand |
| <i>Overburden stripped</i> | Not reported |
| <i>Number of employees</i> | 66 staff including contractors |

Boral quarries have combined reserves in excess of 25 million tonnes with extensive resources at Boomer Hills (Rocherlea) and McGraths quarry at Relbia. There was strong demand for Boral's concrete aggregates and road base products, driven by contracts to supply materials for major projects including the Dilston and Brighton bypasses and the West Tamar Highway intersection project.

Rehabilitation is progressing in the Western pit at the Launceston quarry as the pit nears the end of its life. In preparation for the re-opening of McGraths quarry an updated EMP has been submitted to the EPA for review and approval.

Boral has committed to the LEAN initiative program at all of their quarries and positive results in safety have followed. The company has also initiated a number of research and development projects with the development phase likely to be some years away.

The company's major capital expenditure during the reporting period was in the form of a Cat 345 excavator for the Launceston quarry.

Cement Australia Holdings Pty Ltd

| | |
|------------------------------|--|
| <i>Current mining leases</i> | Railton |
| <i>Total area</i> | 632 hectares |
| <i>Regions</i> | Northwest |
| <i>Total production</i> | 19 554 tonnes high grade crushed limestone 1.57 million tonnes limestone/clay for cement production |
| <i>Overburden stripped</i> | 7.4 million tonnes stone 153 000 tonnes clay 240 000 tonnes waste |
| <i>Number of employees</i> | 21 staff and 2 contractors |

Cement Australia Holdings Pty Ltd operates a limestone mine and cement plant at Railton. The plant produces cement using the fuel-efficient pre-calcliner manufacturing process and has its own limestone mine and operation. The

majority of products were shipped to markets in Victoria and New South Wales via the Port of Devonport.

The mines rehabilitation plan was updated during the reporting period and works continued on the spoil area with revegetation work that utilised native plants. Work on the Site Water Management Plan, which included installation of a new dewatering system, was completed. The old pumps were replaced by a diesel pump and the company is currently planning on purchasing a \$1.5 million electrical pump for its future requirements.

Circular Head Dolomite & Trading Co. Pty Ltd

| | |
|------------------------------|---|
| <i>Current mining leases</i> | Circular Head |
| <i>Total area</i> | 131 hectares |
| <i>Regions</i> | Far northwest |
| <i>Total production</i> | 55 041 tonnes screenings 32 419 tonnes powder 7033 m ³ readymix concrete |
| <i>Overburden stripped</i> | Nil |
| <i>Number of employees</i> | 13 |

The company is in the process of reviewing its environmental licence requirements with the EPA

Cresswells Transport Pty Ltd

| | |
|------------------------------|---|
| <i>Current mining leases</i> | Mayberry, Deloraine and Lake Highway |
| <i>Total area</i> | 134 hectares |
| <i>Regions</i> | Northwest coast |
| <i>Total production</i> | 12 815 tonnes of road production material |
| <i>Overburden stripped</i> | Nil |
| <i>Number of employees</i> | 7–8 |

During the reporting period, Cresswells applied for and was granted exploration licences at Togari and Eddy Creek, for both construction materials and industrial minerals.

Duggans Pty Ltd

| | |
|------------------------------|--|
| <i>Current mining leases</i> | Cradoc, East Picton Road |
| <i>Total area</i> | 138 hectares |
| <i>Regions</i> | Huon Valley |
| <i>Total production</i> | 30 000 tonnes construction materials 65 000 tonnes road materials 2500 tonnes sand |
| <i>Overburden stripped</i> | Not reported |
| <i>Number of employees</i> | Six full time and five sub-contractors in the quarry division |

Quarry operations were concentrated at the Cradoc quarry. Rehabilitation and environmental management initiatives in place include concrete recycling and annual slashing/spraying for weeds. Trees have been planted in bund walls and sandstone areas to reduce visual impact.

New developments and capital expenditure items include a new track-mounted primary crusher and the ongoing upgrade to crushing equipment and secondary plant. Duggans also has a newly upgraded precast concrete

factory, a civil works department and batching plant operation hired to an external customer, and a second concrete batching factory in Launceston. Duggans operations across all businesses employee 70 staff in total.

FR & CM Lazenby and Son

| | |
|------------------------------|-----------------------|
| <i>Current mining leases</i> | South Arm |
| <i>Total area</i> | 148 hectares |
| <i>Regions</i> | Sandford |
| <i>Total production</i> | 17 906 tonnes of sand |
| <i>Overburden stripped</i> | Nil |
| <i>Number of employees</i> | 5 |

No new developments, upgrades or items of interest were reported. Rehabilitation works were completed for one hectare of disturbed ground.

GL & DH Males Pty Ltd

G L & D H Males operates a sand pit at South Arm and a retail operation in South Hobart. The company produces washed and horticultural sand, and concrete and bedding sand.

Gunns Forest Products P/L

| | |
|------------------------------|---|
| <i>Current mining leases</i> | 66 leases |
| <i>Total area</i> | 400 hectares |
| <i>Regions</i> | Statewide |
| <i>Total production</i> | 29 642 tonnes crushed material at 25 mm, 30 mm, 40 mm and 75 mm 1818 tonnes shot rock at 100 mm 61 894 tonnes base material |
| <i>Overburden stripped</i> | Nil, operations restricted to existing quarry footprints |
| <i>Number of employees</i> | One company employee and eleven contractors |

Gravel road construction for the year was 104.7 kilometres. Initial rehabilitation works have been undertaken at several sites including Rayners Hill, Burns Pit, Mother Logans 1, Carters Track, Coates Road and Rooney's Tier.

As a result of the recent restructure and transition out of native forest into a plantation-based operation, there has been a significant impact on activity levels within the company's quarries over the reporting period. Gunns are in the process of transferring a number of leases to new operators.

Hanson Construction Materials Pty Ltd

| | |
|------------------------------|--|
| <i>Current mining leases</i> | Flagstaff Gully, Upper Calder and Potato Hill |
| <i>Total area</i> | 379 hectares |
| <i>Regions</i> | Hobart, far northwest and Low Head |
| <i>Total production</i> | 175 000 tonnes aggregates 111 000 tonnes road materials 58 000 tonnes sand |
| <i>Overburden stripped</i> | Not reported |

Number of employees 17.5 full-time equivalent employees across all three operations

The application to extend and rezone the Flagstaff Gully quarry has been approved by the Clarence City Council and ratified by the Tasmanian Planning Commission. Final sign-off by EPA and the Clarence City Council is expected to be in place by October 2011.

Rehabilitation works have continued at all sites. At Flagstaff Gully, overburden has been stripped and stockpiled for future rehabilitation works. During winter/spring 2010, contractors were engaged to continue the elimination of pampas grass with a second stage undertaken during summer. The rehabilitation plan for the Calder quarry has been completed and work is progressing, with the SW Pits 1 & 2 80% rehabilitated and the West Central Pit 100% rehabilitated. Weed eradication programs have continued at both sites with spraying conducted during the reporting period.

The Flagstaff Gully quarry has an internal capital application in place for a downhill power generating conveyor and new primary crushing plant to allow access to reserves at the top of the hill. A new weighbridge was recently installed.

■ Hazell Brothers/HBMI Pty Ltd

Current mining leases Leslie Vale, Long Hill, Flowerdale, Scottsdale

Total area 871 hectares

Regions Statewide

Total production 700 000 tonnes road base
100 000 tonnes concrete and asphalt aggregate
50 000 tonnes concrete sand

Overburden stripped 10 000 m³ at Leslie Vale

Number of employees 24 full-time employees and approximately 70 contractors for ancillary roles

The quarry division of the business is integral in supporting the company's other operations in construction and project management for major projects such as the Brighton and Kingston bypasses.

The company has recently purchased a front-end loader and excavator to provide additional plant in support of the quarrying operations.

■ Island Enterprises (Tas) Pty Ltd

Island Enterprises operates on several leases in the Scottsdale region, primarily producing sand and gravel.

■ Lloyds North

Current mining leases Ulverstone and Riggs Road

Total area 77 hectares

Regions Northwest coast

Total production 67 815 tonnes concrete, sealing aggregate and concrete dust
23 941 tonnes road base
73 528 tonnes basalt (Riggs Road)

Overburden stripped Nil

Number of employees Eight staff including contractors

Compliance with the Environment Division's EPN and the company's ISO 14001:2004 accreditation continued throughout the reporting period, as did the plant safety upgrades and process improvements.

Capital expenditure projects included works on lower bench extraction at the Riggs Road site and ongoing plant safety upgrades and process improvements across the Kimberley Road site.

■ Norske Skog Boyer

Current mining leases Blue Gum Knob, Black Bobs, Uxbridge, Mt Lloyd, Repulse Dam, Maydena, Nubeena, Wayatinah, Tyenna, Lyell Highway

Total area 104 hectares

Regions Southwest and Storm Bay

Total production 20 000 tonnes road material at 30 mm, 60 mm, 100 mm and 120 mm

Overburden stripped Minimal

Number of employees One full-time company employee plus contractors

Norske Skog quarries operate on a campaign basis for forestry road construction/maintenance. During the year the majority of operations were in the Plenty Valley and Styx Valley and at Tyenna, Ellendale and Wayatinah. There was also significant activity in isolated regions including the Midlands and East Coast.

Due to the variation in demand for quarried material (based on the location of new roads required for harvesting operations and road maintenance, a function of the location of harvesting operations, transport routes and weather) it is anticipated that demand in future years will be similar to current levels.

Two quarries will require further rehabilitation prior to inspection and surrender.

Norske Skog outsources labour and machinery to MSD Constructions which employs 20 people, with two to five employees gainfully employed during quarry operations. One full-time Norske Skog employee supervises the contractors.

■ Sanbar (RNB Trading) Pty Ltd

Current mining leases Llanherne

Total area 510 hectares

Regions Seven Mile Beach

Total production 87 000 tonnes screened sand
46 000 tonnes bedding sand

Overburden stripped Nil

Number of employees 3

The company has continued production and stockpiling of bedding sand in anticipation of a major upcoming project, with approximately 73 000 tonnes now produced ready for transport.

Rehabilitation efforts have continued through the reporting period with current revegetation performing well now that browsing issues have been controlled.

■ Sibelco Lime (Tasmania) Pty Ltd

Sibelco Lime (Tasmania) Pty Ltd, formerly known as Unimin Lime (Tasmania) Pty Ltd, operates a limestone quarry and calcination plant at Mole Creek, producing crushed stone, Ag-lime and other lime products.

■ Stornoway Hewitt Pty Ltd

Current mining leases Beauty Point, Kamona, Scottsdale, Rowella

Total area 271 hectares

Regions Tamar Valley and northeast coast

Total production 88 852 tonnes washed sand
1261 m³ batch concrete

Overburden stripped 10 000 tonnes

Number of employees 11

Over the past nine months, Stornoway Hewitt has installed a new sand drying plant to service various customers. Production is expected to continue at present levels in the coming financial year. Rehabilitation of five hectares of disturbed ground was completed.

■ Stornoway Quarries Pty Ltd

Current mining leases Breadalbane, Merseylea, Marshall Creek and Glengarry

Total area 288 hectares

Regions Bakers Beach and Relbia

Total production 407 000 tonnes roading material and aggregates

Overburden stripped Nil

Number of employees 16

During the reporting period, Stornoway quarries gained approval to increase production at the Breadalbane quarry.

The company has invested around \$3.5 million in equipment over the last two years with a further \$1 million now being considered for growth capital.

Environmental management initiatives at Breadalbane included increasing the settling pond size to control water emissions, and the construction of visual/acoustic bund walls to allow the operation to move south. Weed management and control has been conducted at three monthly intervals across the site. Two permanent blast monitoring stations have been installed along with the design of blasting practises to suit the best practices for the operation.

■ Treloar Transport

Current mining leases Claude Road, Forthside, Lea River, Punched Terror, Shackley Hill and Cethana

Total area 70 hectares

Regions Northwest

Total production 50 000 tonnes sub base 1 & 2
30 000 tonnes base course
20 000 tonnes pit run gravel
17 000 tonnes other products

Overburden stripped Not applicable

Number of employees Four full time and two contractors

The primary site of operations is Shackley Hill near Sheffield, which has approximately 20 years mine life based on current production. A new Dooson Mega 400 Loader was purchased during the reporting period.

Rehabilitation and environmental management initiatives include continued work on mitigating leeching from iron pyrites through the use of limestone and settlement ponds and improved surface water management.

A safety audit was completed for quarry operations and recommendations are currently being implemented.

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

Remediation of tin mine tailings at Royal George and mine shaft safety were the main activities undertaken by the Trust Fund during 2010/2011.

Mine shafts at Lefroy, Scamander/St Helens, Beulah, Rossarden, Mathinna and Zeehan were either covered or backfilled to provide for public safety.

Follow-up revegetation and weed management was carried out on previously rehabilitated sites at Balfour, Storys Creek and Sisters Hills.

Approximately \$189,000 was spent on Trust Fund projects during 2010/2011.

Mine Safety

- Eight mine shafts were capped on Star of the West Hill near Beulah (\$23,940).
- Six mine shafts were capped at Beauty Flats near Mathinna (\$6,520).
- Two shafts were capped and a third shaft was backfilled at Trafalgar Flats near St Helens (\$6,640).
- A grated cover was installed over the Orieco main shaft at Scamander (\$15,270).

- Mine shaft fences were repaired and a grated cover installed over the Volunteer main shaft at Lefroy (\$57,560).
- Two shafts were capped at the Montana No. 1 mine near Zeehan (\$6,300).
- A ventilation shaft cover was repaired at Rossarden (\$230).

Mine and Quarry Rehabilitation

- Rehabilitation of historic tailings at the Royal George tin mine continued. Work undertaken comprised sediment retention work, drainage modifications, lime and fertiliser application, surface cultivation, seeding and continuing weed management (\$61,860).
- Weed monitoring and management on previously rehabilitated sites at Storys Creek (\$860).
- Weed monitoring and management on previously rehabilitated quarries in the Dip Ranges Regional Reserve (Sisters Hills) (\$1,170).
- Revegetation work at Balfour (\$8,700).

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