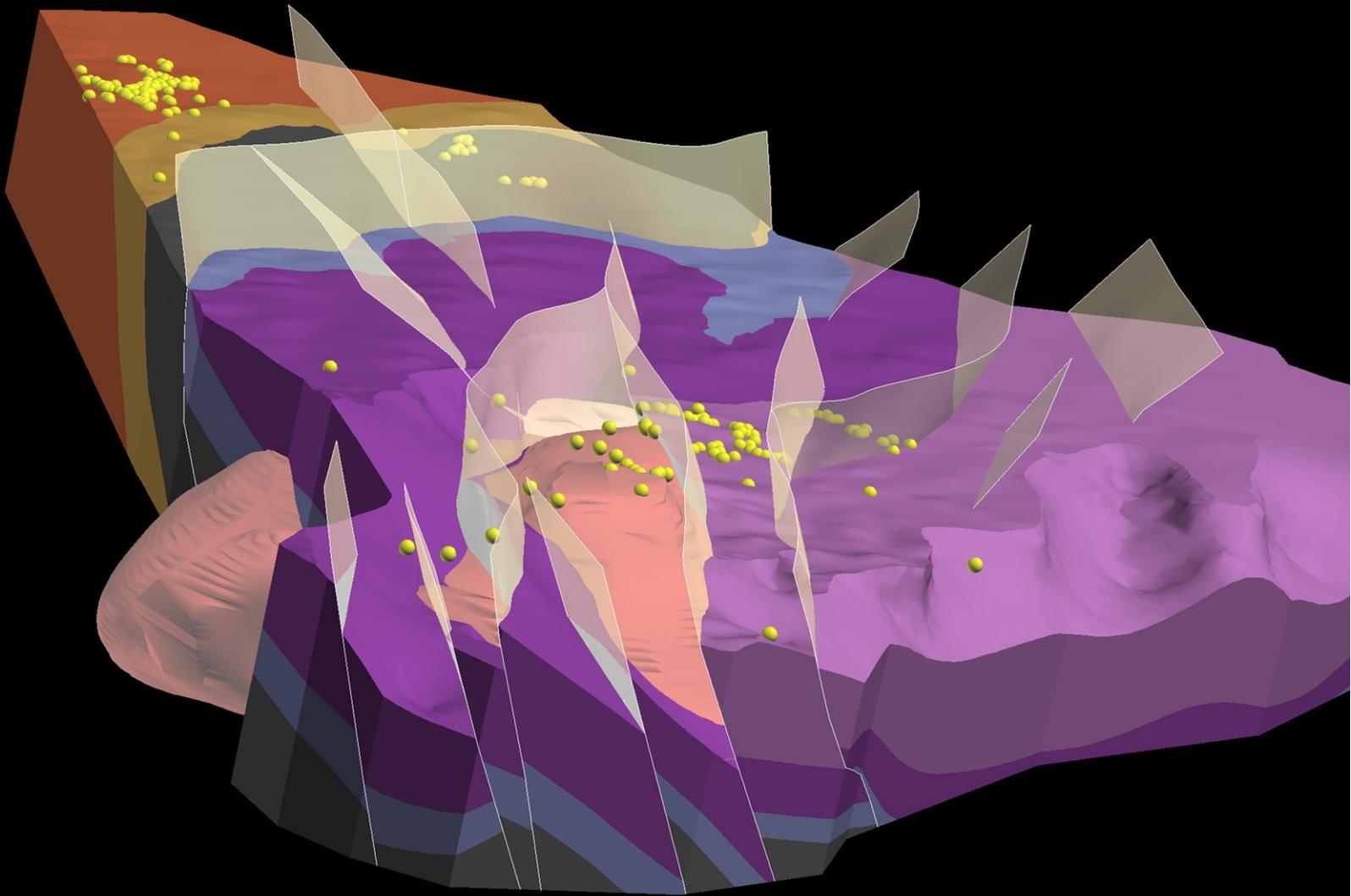


Mineral Resources Tasmania



Annual Review 2009/2010

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Cover: 3-D geological model of the area between the River Tamar and Scottsdale Batholith in northeast Tasmania showing the fault architecture, rock units up to the base of the Lower Devonian sandstone, and known gold deposits. Devonian granite is in light pink. Orogenic gold deposition was initiated during SW-directed thrusting and shows control by lithology and lithological contacts. Clusters of deposits in the southeast of the area suggest local control by granite intrusions.

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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, including offshore waters administered by the State, and the promotion of vacant areas available for onshore and offshore 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.

Major issues and initiatives for 2010/2011

- Complete reporting of the *TasExplore* geoscientific data initiative including the completion of a revised three-dimensional geological model of northeast Tasmania.
- 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.
- Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- 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.

Management of Mineral Resources Tasmania (as at 30 June 2010)

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Mineral Resources Tasmania Summary of Activities, 2009/2010

Major initiatives

The major initiatives and issues affecting MRT in 2009/2010 included:

- Continuing the *TasExplore* geoscientific data and promotion initiative during its final year of funding, with completion of the final stage of the gravity survey in northeast Tasmania and preparation of new mantle and granite models for the area. New geological mapping in northeast Tasmania has been completed and 90% has been compiled and submitted for drafting.
- This work represents a major advance in the understanding of the geology of the northeast region and should enable better focussed mineral exploration, especially for gold. Three-dimensional geological models of two gold-rich areas have been prepared and a regional model will follow. One report into the work was completed at year's end and another was well advanced.
- Work continued on preparation of a report on the Savage River iron ore deposit and two geological map sheets were mapped on King Island.
 - 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 mineral exploration in Tasmania.
 - Provision of resources for environmental monitoring of exploration and mining tenements, and for inspection of mines and quarries.

The major issues and initiatives for 2010/2011 are to:

- Complete reporting of the *TasExplore* geoscientific data initiative including the completion of a revised three-dimensional geological model of northeast Tasmania.
- 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.
- Produce land stability maps of urban areas in Tasmania, in line with the guidelines developed following the Thredbo disaster.
- 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.

Achievements against strategies identified for 2009/2010

New initiatives to stimulate mineral exploration in Tasmania

A recovery in mineral exploration expenditure was experienced in 2009/2010 following a decline in the latter part of the previous year, but for most of the year expenditure was not to the record level of 2007/2008. According to Australian Bureau of Statistics (ABS) data, expenditure on mineral exploration for 2009/2010 was \$20.7 million, up slightly on the \$20.4 million of the previous year. Tasmania's share of Australian exploration expenditure was 0.91%, virtually unchanged from 0.92%. However ABS data show that \$13.5 million, or 66% of total expenditure, was spent on the search for new deposits, significantly higher than the 57% recorded in 2008/2009.

MRT data indicate that the ABS continues to under-report Tasmanian exploration expenditure, as the MRT figure for 2009/2010 was \$30.01 million of which \$16.78 million or 56% of the total was spent on exploration licences.

The high proportion of expenditure directed to the search for new deposits in both data sets is an extremely satisfying result, as it indicates investment in the future Tasmanian mining industry. Further, the June 2010 quarter figures of both the ABS and MRT show that exploration expenditure had recovered to 2007/2008 levels, a trend maintained into the September 2010 quarter.

Promotion of mineral and petroleum potential

The Tasmanian Government provided \$240,000 in 2009/2010 to actively market mineral exploration opportunities in Tasmania. Activities undertaken included holding a display at the world's leading exploration forum, the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) in Toronto, and visiting leading international mining companies in Toronto, London and Hong Kong.

In addition to the PDAC meeting, presentations were made to the Tasmanian Minerals Council Exploration Group Meeting at Launceston in May, and to the Association of Mineral Exploration Companies Convention in Perth in June.

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 the geoscientific programs conducted by MRT. These promotions have been successful and continue to play a direct part in attracting new exploration companies to Tasmania, as well as stimulating interest in potential new mining and mineral processing projects. Several meetings were also held with companies on a one-on-one basis with DIER personnel.

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.

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, samples and geochemistry. Once loaded, the information is made available to clients using the MRT website. Other information available includes mineral tenements and documents held by MRT, and general information for MRT and DIER clients.

The recorded volume of downloads from the MRT website totalled 9796 gigabytes, compared to a total of 5602 gigabytes in the previous year. This increase is assumed to reflect a continuation of the explorer focus on office-based studies in preparation for higher levels of field activity as financial constraints lift. The number of visits per day has also risen substantially to an average of 836 from last year's average value of 368 over the course of the year. Development and maintenance of the TIGER system was successfully carried out using a combination of contractors and MRT staff. In addition to data being accessed from the MRT website, 188 data packages were distributed to clients.

Data capture/output was completed for sixteen *TasExplore* initiative map tiles in northeast Tasmania (Ansons Bay, Beaumaris, Bell Bay, Blue Tier, Bowood, Bridport, Falmouth, Lanka, Lilydale, Low Head, Nabowla, Retreat, Spurrs Rivulet, Tam O'Shanter, The Gardens and Weymouth). Data capture/output was also completed for the Naracoopa 1:25 000 scale map tile on King Island.

Mapping of the Mathinna Supergroup sedimentary succession in northeast Tasmania was completed, with the first mapped subdivisions of this major unit being defined over a significant part of the region. The work has identified major structures and has provided new insights into the controls of gold location. Preliminary 3-D geological models have been constructed for the area west of Scottsdale and the gold trend between the Mathinna and Alberton areas. Field mapping of the Naracoopa and Stokes map tiles on King Island was completed and Naracoopa was submitted for map production, while a significant part of the Pearshape sheet has been mapped. A report has been completed on the geology of the Mathinna Supergroup in the Scamander area and a report on the geology of the area between Bridport and the River Tamar was well advanced.

A report on the geochemistry and mode of formation of the Savage River iron deposit is nearing completion and will provide a new understanding of the origin of the deposit. This work will have important implications for future exploration of the Arthur Lineament of northwest Tasmania.

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.

A set of landslide maps for the region from Devonport to Boat Harbour Beach on the North West Coast, an area renowned for the high incidence of landslides, was completed. These maps are intended to improve land-use decisions by regulators and other stakeholders. A two-day workshop was held in Ulverstone to ensure that the new information was understood by the key stakeholders. Work has commenced on a similar mapping project along the northern Tamar Valley, another area with a well known history of landslide activity.

Ongoing data entry and maintenance occurred to the TIGER landslide database during the year and there are now about 2300 records from throughout Tasmania. The database has become web enabled and publicly accessible.

MRT continues to coordinate the ongoing monitoring of the School Creek landslide in Hobart and the Lawrence Vale landslide in Launceston. Regular inclinometer surveys provide information for the management of these areas and their surrounds. The first records of movement have been detected on the Taroona monitoring system, with approximately 36 mm recorded on the School Creek landslide.

MRT, in conjunction with Geoscience Australia, completed a suite of work addressing tsunami hazard in Tasmania. The work culminated in the release of a report documenting possible historical tsunamis in Tasmania.

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.

During the year 74 exploration work programs were submitted to MRT, compared with 70 in the previous year. Sixty-two of these programs were approved, including 33 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 2009/2010 there were 593 mining leases in force. During the reporting period, 34 new leases were applied for and 148 applications for new leases, renewals, transfers and surrender of a lease were processed. The economic downturn in the minerals industry appears to have stabilised in Tasmania with several operators undertaking new exploration programs and other developments on their mining leases. Strong metal prices over the reporting period, in particular the price of tin, has also encouraged further investment in the Tasmania mining industry.

At Hellyer, the new Fossey underground operation is being developed to allow mining to commence in 2010/2011. The Que River open cut has been decommissioned with infilling and rehabilitation underway. At Henty, Unity Mining Ltd initiated an extensive surface and underground exploration program. Production was reduced at Savage River due to a rock fall in the open cut, and at Mt Lyell due to an underground mud flow. Mount Bischoff has entered into a care and maintenance phase pending underground feasibility studies and Avebury remained on care and maintenance during the reporting period.

Operations at the Beaconsfield gold mine continued. A new tailings storage facility was constructed and good production reported. BCD Resources NL has entered into a financial agreement with Minemakers Limited.

The Cornwall Coal Company Pty Ltd has developed the Fenton Seam at Mt Nicholas and Cullenswood 2 open cut in the Fingal Valley. The leases held by Van Diemen Mines Pty Ltd at Scotia, near Gladstone, have been relinquished by the administrator. The security deposit was called in by MRT and rehabilitation works are scheduled for 2011.

Town planning is an important constraint on the development of extractive operations. Land stability, access

to mineral resources and encroachment onto extractive industries continue to be key town planning issues across most municipalities. Submissions, representations, appeals and advice have been made to the Northern Midlands, Glenorchy, Clarence, George Town and Brighton councils concerning planning schemes or development applications. A long running appeal over the Tolosa Street quarry in Glenorchy was resolved.

A total of fifteen alleged illegal mining activities were investigated during the reporting period throughout Tasmania.

Rehabilitation of Mining Lands Trust Fund

The major focus of activity during 2009/2010 was mine site safety, with mine shafts and adits at Warrentinna, Lefroy, Beaconsfield, Scamander, Zeehan and Gipps Creek being either capped or fitted with grating to provide for public safety. Minor follow-up works were carried out on previous rehabilitation at several abandoned mine sites and quarries. The main land remediation projects for the year were preparation and planning for rehabilitation of historic tailings at Royal George, and rehabilitation of gravel pits at Sisters Hills. A total of \$91,367 was spent on trust fund projects during 2009/2010.

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 their non-renewable resources.

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 system, where royalty is paid on the net sales and profits earned from the operation. Royalty on the recovery of industrial minerals and construction materials on Crown leases is set on a per cubic metre or per tonne basis.

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

Mineral royalties totalling \$34.7 million were collected during the 2009/2010 financial year, a marked increase from the \$27.8 million collected in 2008/2009. Royalty collection in the previous year was affected by the global financial crisis and the impact this had on commodity prices.

Financial Performance

The 2009/2010 consolidated fund appropriation to Mineral Resources Tasmania was \$6.08 million, after budget management strategies were implemented. This funding consisted of:

- \$4.30 million for salaries for 53.5 full-time-equivalent staff, plus four temporary staff;
- \$1.15 million for operating expenditure, including rent;
- \$0.17 million for the Restoration of Degraded Mineral Lands;
- \$0.05 million for the promotion of Tasmanian mineral opportunities; and
- \$0.41 million for the fourth year of the four-year *TasExplore* project, which included the funding for the four temporary staff.

In 2006/2007 MRT was funded \$5.06 million over four years under Election Commitment funds to undertake the *TasExplore* project, which is to acquire new data for updating TIGER and the 3D geological model, and to undertake a comprehensive promotional program. The 2009/2010 financial year was the final year of the project.

The onset of the global financial crisis placed significant stress on the State's financial capacity and the department was required to make significant expenditure cuts to assist in meeting the budget task. As a result, MRT made a number of cuts to existing programs, which included vacancy management.

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

Outputs — Application of funds, 2009/2010

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	3,740
2. Tenement management of the exploration and minerals industry	2,895
Total	6,635

Descriptions of Outputs and Outcomes, 2009/2010

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

Mineral royalties totalling \$34.7 million were collected during the 2009/2010 financial year, a marked increase from the \$27.8 million collected in 2008/2009. Royalty collection in the previous year was affected by the global financial crisis and the impact this had on commodity prices. There was a general improvement in commodity prices during 2009/2010.

Royalty revenues remain well above the \$4.5 million collected in 2002/2003 and above the five-year average of \$25 million.

Royalty revenues for 2010/2011 are budgeted at \$40.71 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 2010. The change in the iron ore pricing mechanism and uncertainty about commodity demand made the forward revenue estimate process difficult.

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 mineral lands raised \$1.739 million in 2009/2010, which was above budget expectation.

	<i>Target 09/10</i>	<i>Actual 09/10</i>	<i>Target 10/11</i>
Royalties (\$,000)	34,000	34,700	40,710
Rents and Fees (\$,000)	1,560	1,537	1,560
Rents and Fees — Petroleum (net of administration) (\$,000)	203	202	203
Sales of Maps and Publications (\$,000)	23	18	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.

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, 2009/2010

A reorganisation of the branch structure was undertaken in October 2009 which resulted in the number of branches being reduced from five to four: Metallic Minerals and Geochemistry; Industrial Minerals and Land Management; Geoscience Information; and Royalty, Finance and Administration.

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

Metallic Minerals and Geochemistry

During 2009/2010, the Metallic Minerals and Geochemistry Branch directed much effort towards the government-funded initiative TIGER Geoscience (*TasExplore*) Project. The Branch also continued to develop databases for delivery on the world-wide web and to verify and update existing databases.

The recovery in levels of mineral exploration during the year, and the large numbers of promotional flyers prepared for Exploration Release Areas, continued to place significant stress on the resources of the Branch, particularly given the demands of the final year of funding for the *TasExplore* project and the imminent retirement of key staff members.

Replacement of key personnel in a timely fashion will be essential for satisfactory levels of effectiveness to be maintained, both in the areas of mineral tenement administration and geoscientific information provision.

Geoscientific data generation

Work continued on a project to better understand the nature of the Savage River iron ore deposit, as part of a broader review of the mineral endowment and potential of the Arthur Lineament. At year's end work was advanced on the final stage of the project, development of an understanding of the mode and timing of formation of the deposit and implications for regional mineral potential.

The geology of 39 map tiles in northeast Tasmania was upgraded as a result of work undertaken during the *TasExplore* project. Upgraded compilations were completed for the Low Head, Bell Bay, Tam O'Shanter, Weymouth, Retreat, Lilydale, Bridport, Bowood, Nabowla, Lisle, Patersonia, Waterhouse, Oxberry, Pearly Brook, Scottsdale, Springfield, Maurice, Tomahawk, Monarch, Pioneer, Derby, Ringarooma, Victoria, Saddleback, Lyme Regis, Musselroe, Gladstone, Lanka, Spurr's Rivulet, Blue Tier, Brilliant, Dublin Town, Naturaliste, Eddystone, Ansons Bay, The Gardens, Binalong, Beaumaris and Falmouth 1:25 000 scale map sheets. The focus of the work was on mapping subdivisions within the Mathinna Supergroup, the main host for gold deposits in the region. Seven formations (subdivisions) have been recognised west of Scottsdale and this has enabled better definition of the controls on gold localisation. A three-dimensional geological model has been completed for this area and a detailed model constructed for the linear zone of gold deposits extending seventy kilometres from Waterhouse through Mathinna to Mangana. The airborne geophysics also enabled better definition of dolerite dykes

and Tertiary volcanic rocks, including potential sapphire source rocks.

On King Island the Naracoopa geological map sheet has been published and the Grassy sheet modified. Mapping of the Stokes sheet has been completed and compilation is in progress. Part of the Pearshape sheet has been mapped.

The hyperspectral infra-red core logging device (HyLogger), funded by the Commonwealth under the National Critical Research Infrastructure (NCRIS) Auscope Virtual Core Library Project, was installed and commenced operating on 13 October. A total of 21 574 metres of core from 96 drill holes was logged during the year and the majority of data was partly processed. Work focussed on the main mineralised belts including the Mount Read Volcanics and northeast goldfields, the latter in part to assist the *TasExplore* project. Following the resignation of the technician, resources did not permit continuation of the project and at the time of writing a replacement technician had not been recruited. A thermal infra-red scanner will be added to the instrument in 2010/2011 which will significantly increase the range of identifiable minerals.

Database development

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

A bulk loading facility for geochemical data was implemented during the year. Information on 1749 new samples and revised data on a further 4016 samples was added to the database during the year.

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

Core library

A high level of usage of the core library continued, with 139 drill core inspection days, a 20% decrease on the previous year. This amounted to 332 person visitation days during the year.

A total of 13.3 km of core was added to the library collection during the year.

During the year a team from the Centre of Excellence in Ore Deposits at the University of Tasmania (CODES) continued using the core library as the site to determine

detailed physical properties of rocks from drill core, as part of a major project aimed at improving metallurgical recovery from ores.

A safety induction procedure for visitors and Rosny staff attending the core store was implemented during the year.

Remaining storage is very limited and 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 \$240,000 in 2009/2010 to actively market mineral exploration opportunities in Tasmania. Activities undertaken included holding a display at the world's leading exploration forum, the Annual Meeting of the Prospectors and Developers Association of Canada (PDAC) in Toronto, and visiting leading international mining companies in Toronto, London and Hong Kong.

Several meetings were also held with companies on a one-on-one basis with DIER personnel.

A paper was presented at the Association of Mining and Exploration Companies Convention in Perth in June. A presentation was given at the Tasmanian Minerals Council Exploration Group Meeting at Launceston in May.

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 the geoscientific programs conducted by MRT.

Information on developments and opportunities in Tasmania was provided for a feature article on Tasmania in *Gold and Minerals Gazette*. Bi-monthly updates on exploration activity in Tasmania were supplied as part of world-wide reports on exploration in the Society of Economic Geologists newsletter.

These promotions have been successful and continue to play a direct part in attracting new exploration companies to Tasmania, as well as stimulating interest in potential new mining and processing projects.

Petrology and lapidary laboratories

The petrology and lapidary laboratories provided a total of \$54,415 worth of analyses and services to both DIER (\$40,600) and external clients (\$13,815). Most of this external work cannot be otherwise conducted within Tasmania.

The lapidary laboratories prepared 665 standard thin sections and 124 other sections, making a total throughput of 789 samples valued at \$22,205. A field assistant did most of these on an as-needed basis. The lapidary procedures were documented and a new lapping machine purchased.

The technical officer for petrological services processed 564 samples by X-ray diffraction, including 249 quantitative dust analyses. He also conducted four soil and sizing tests and 52 optical asbestos identifications, for a total of 620 samples processed valued at \$32,210. About half of his time was

spent preparing samples for, and operating, the XRF for the geochemistry section, and doing database work.

The XRD laboratory is now the national centre assisting other State geological surveys with the Auscope National Virtual Core Library project. Time has been spent in looking at the purchase of a new XRD system for this work, and looking at the XRD systems at the CSIRO and Adelaide University.

The microscope laboratories have been audited; one old microscope has been sold and one new microscope camera purchased.

A total of 447 external (contract) samples was received for investigation, mostly by X-ray diffraction analysis. These samples included 312 for occupational health clients, 63 soils, 23 construction materials, five industrial samples, eight forensic samples, and 133 general rocks and other samples. This external work came from a wide range of external sources, including government departments, the University of Tasmania (staff and students), various mining, mineral processing and mineral exploration companies, environmental and occupational health consultants, the general public and miscellaneous businesses.

Samples studied included geological materials (construction materials, mineral concentrates, ore samples, rocks, soil, sand and clay) and anthropogenic materials (including forensic samples, concrete, asbestos sheeting, industrial materials, dusts and acid drainage). Forensic studies continued with work for Tasmania Police; one court case required the attendance of the petrologist as an expert witness.

The petrologist, as official radiation safety officer, has overseen some radiation storage, X-ray equipment safety inspections and other safety issues. Laboratory safety audits are underway. Discussions with the National Association of Testing Authorities (NATA) and Workplace Standards Tasmania were conducted to determine whether the laboratories should be NATA-registered; this has been deferred for the present.

Curatorial, PR and displays

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 (over 11,000 samples have been done to date) and to mitigate safety issues. Retiring geologists have been assisted with their sample and data storage.

The mineralogist/petrologist liaises with lapidary clubs and companies, the Tasmanian Minerals Council and the general public on lapidary and gem and mineral collecting matters. He represented MRT at gem and mineral shows in both Hobart and Zeehan, and this included substantial sales (over \$4100) of books, maps, fossicking licences and other products.

Former Tasmanian racing car driver Marcos Ambrose, now competing in the USA, and a USA television crew were taken around Tasmania looking at gold and mines, with the

group also visiting the Mornington core store. The two resulting cable TV shows have been shown to multi-million viewer audiences in North America.

The mineralogist/petrologist revised the alluvial gold book and is also revising and helping add to the designated fossicking areas in Tasmania.

The mineralogist/petrologist has now been accredited for radiation safety assessments, and has assisted the University of Tasmania in this regard, as well as revising the radiation management plans and safety audits for MRT. He assists with storage of some radioactive, asbestos-bearing and other dangerous substances, and has updated the guidelines for their handling.

The petrologist also handled about 158 public and commercial enquiries 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. He gave geology/mineralogy talks to several schools, provides mineralogical and curatorial advice to the Tasmanian Museum and Art Gallery when required, and mineralogical advice to Tasmania Police on relevant forensic matters.

Geochemical laboratory

The laboratory was staffed for 2009/2010 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 2009/2010 financial year included:

- Maintaining a safe working environment for the geochemical and crushing laboratories, in compliance with the Australian OH&S standards.
- Annual medical examination for technical officers (general health, hearing, blood tests).
- Registration of 315 rock samples resulting in 14,175 individual determinations. A total of 21,117 individual determinations, equivalent to 460 rock samples, were also analysed for major and trace elements with a value of around \$177,000.
- A new XRF unit was purchased after extensive investigation to find the best value for the price, and also to choose a unit that serves MRT's geochemical activities the best. The unit was successfully installed and calibrated. Measuring programs for some 45 elements were successfully conducted and calibrated. The new XRF unit requires much less measuring time and provides results with considerably higher precision and accuracy than the old unit. It has been almost trouble-free and has saved considerable time for the operating staff. The old XRF unit was over 25 years old and became non-operational before the new one was purchased.

- A new set of certified standards was purchased for the new XRF unit. This enabled us to have more accurate calibration to measure more elements in the measuring programs.
- A tungsten carbide pot, a pulverising mill and an air compressor were purchased for the rock crushing laboratory at the Mornington complex. These were purchased as existing equipment was very old and needed continuous maintenance which was very time consuming.
- A business rule that all the generated internal geochemical results be bulk-loaded into the TIGER database before being sent to the relevant geologists was implemented. This ensures that all the geochemical results are captured in the TIGER database.
- The Leco Induction Furnace continues to produce reliable CO₂ values (necessary for a complete rock analysis). This required extensive experimental work to locate some existing faults. The Leco is in excess of 25 years old and may need to be replaced in the near future as it is becoming increasingly difficult to source replacement parts.

The geochemical laboratories are continuously improving in terms of OH&S issues, analytical procedures and equipment. This has made the laboratories much safer and more productive workplaces.

Other activities

- Field staff updated first aid qualifications in August and fire warden refresher courses were attended by relevant staff.
- Field staff attended a training course in operations in remote and isolated areas.
- Three staff members are on safety committees, including as Chair.
- A branch member, now retired, was on a committee to prepare authority tables for the National Geodata Model, a working group established under the Government Geologists Information Policy Advisory Committee.
- Another branch member is on a committee to provide a national model for mineral deposits data.
- A further 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 meeting of the Centre of Excellence in Ore Deposits at the University of Tasmania (CODES) was attended.

- A Ministerial Council Standing Committee of Officials meeting was attended in Perth on behalf of the Director of Mines.

Industrial Minerals and Land Management

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.

Environment, Land Management & Industrial Minerals

Industrial minerals

Tasmania Magnesite NL holds retention licences over the large, high-grade magnesite deposits at Arthur River and Lyons River in western Tasmania. The company recently changed ownership and has lodged a mining lease application over an area contained within the retention licences and is seeking approval to mine. The owners continue to look for opportunities for the use of this resource, while the CSIRO is progressing with the development of a commercial magnesium metal process.

There has been active exploration for silica flour throughout the past year. Tasmanian Advanced Minerals Pty Ltd has continued mining at the Corinna and Blackwater mines. The company has recently lodged a mining lease application in the Hawkes Creek area to the northwest of the Blackwater operation and is continuing treatment of silica flour at its Wynyard plant.

Environmental management

The number of exploration work programs submitted for approval has dropped back from ninety-six at the height of the mineral exploration boom to seventy-four in the current year.

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.

Seventy-four work programs were submitted to MRT during the year compared with seventy in 2008/2009. Of those received, sixty-two were approved, five were withdrawn, five have since been approved and two are pending. Thirty-three 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	101	60	120	12	95	0
Helipad site	6	5	3	0	0	0
Bulk sample site	0	0	1	0	0	0
Grid (km)	23.46	9.60	13.11	0.23	1.70	0.57
Track (km)	14.35	12.86	2.06	0.50	0.80	1.49

A total of 7.98 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	0.83	0.57	0.46	0.14	0.44	0
Track	4.49	3.81	1.03	0.02	0	0.30
Helipad site	0.08	0.08	0.08	0.00	0	0
Bulk sample site	0	0	0.13	0	0	0

Of the 7.98 hectares of disturbance, 1.18 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 15% 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	0.17	0.13	0.28	0.08	0.05	0
Track	0.00	0	0.33	0.02	0	0
Bulk sample site	0	0	0.12	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)						
2006/2007	3.83	4.63	0.16	0.38	0.03	9.03
2007/2008	6.23	3.96	0.17	0.50	0.03	10.88
2008/2009	3.92	2.25	0.62	2.10	0.00	8.89
2009/2010	5.39	1.69	0.16	0.44	0.30	7.98
Rehabilitated (ha)						
2006/2007	2.01	3.73	0.16	0.38	0.03	6.30
2007/2008	1.18	0.98	0.05	0.34	0.00	2.55
2008/2009	0.20	1.05	0.62	0.31	0.00	2.19
2009/2010	0.17	0.60	0.10	0.05	0.00	0.92

Approximately 33% 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
2006/2007	0.74	0.30	41%
2007/2008	4.62	0.13	3%
2008/2009	2.19	0.06	3%
2009/2010	4.46	0.13	3%

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. It is planned to have the revised code ready for public comment in 2010/2011.

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

Mines Inspection

Exploration on Mining Leases

On-lease exploration programs were approved on the Henty, Cornwall Coal (Mt Nicholas), Rosebery, Que River and Renison leases.

Mine rehabilitation

The Savage River Remediation Program (SRRP) is a joint program between the Department of Primary Industries, Parks, Water and Environment (DPIPWE) and Grange Resources to improve historic environmental liabilities at the Savage River mine. Work continued during the year to investigate and reduce legacy acid drainage on the mine site.

An expert peer review of the program was undertaken in the previous reporting period. The review identified the potential to opportunistically thicken and/or de-pyritise the tailings to facilitate a hydraulic cover over the old tailings dam and Main Creek tailings dam. This investigation will commence in 2011.

A remediation program is underway to reduce acid drainage from the Mt Lyell mine into the Queen River, which discharges into the King River and Macquarie Harbour. Proposals to treat acid seepage from the Mt Lyell lease have been received and are currently under review.

Town planning and quarries

Hanson Construction Materials Pty Ltd has submitted the documentation for a quarry extension at their Flagstaff Gully quarry. The extension required an amendment to the planning scheme, which has been approved by the Clarence City Council and ratified by the Tasmanian Planning Commission.

The Northern Midlands Council received and approved a development application for a residence on land at Relbia near a number of quarry operations. The quarry operators and MRT appealed against this decision as the proposed residence was within the recommended attenuation distance for these quarries. MRT considered that the quarries were of regional importance and any residential encroachment would impede their future development. The Resource Management and Planning Appeal Tribunal determined that the development application was incomplete and any decision by the Northern Midlands Council was therefore invalid.

Work continued on the development of the mining lease inspection system (MLIS) to interface with REGIS in the TIGER System. The mine disturbance GIS (MLIGIS) program is operational and in use by the inspectors.

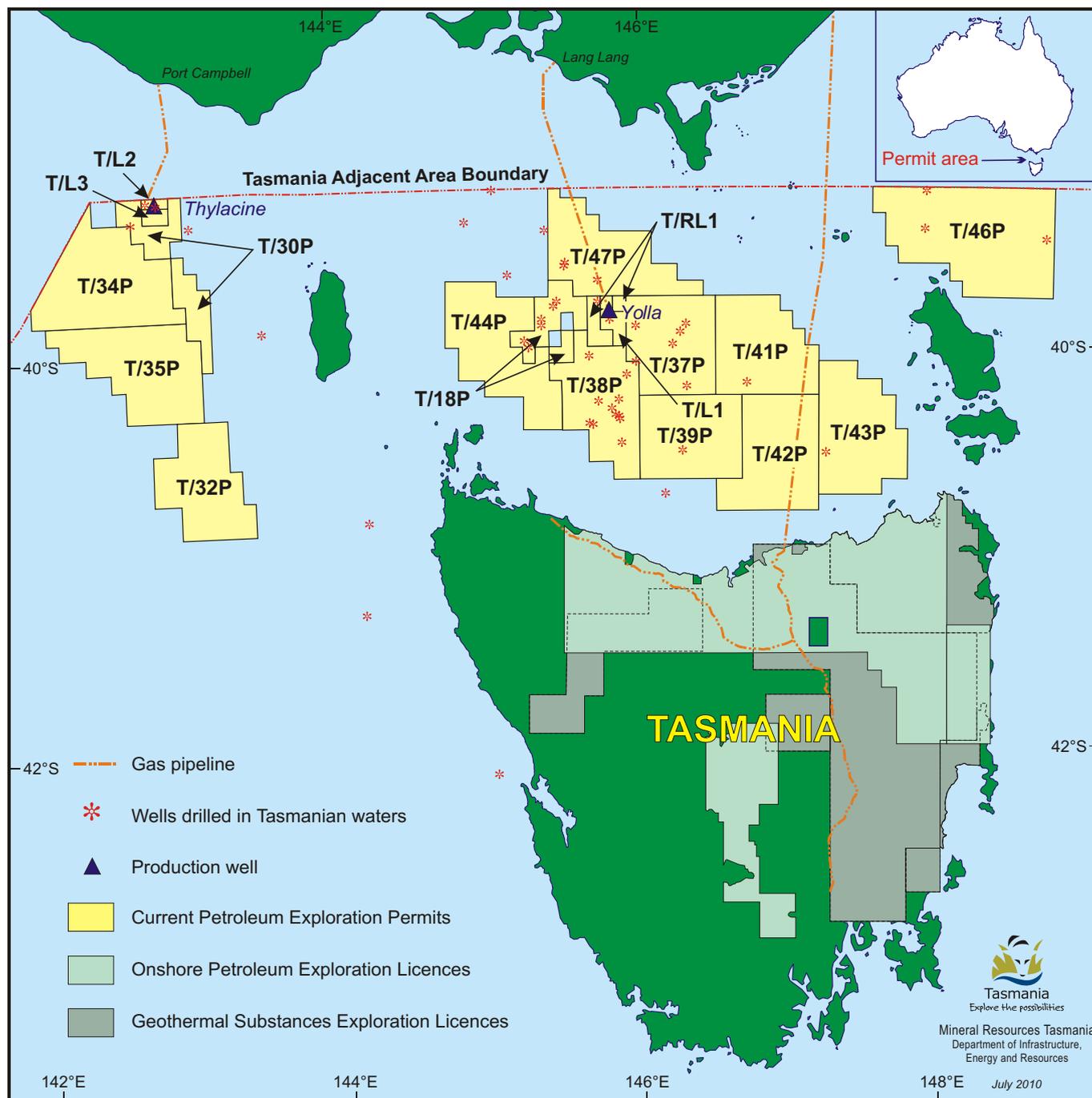
Hydrocarbons

Petroleum exploration and production

Fourteen offshore permits and two onshore licences were held for oil and gas exploration. Three production licences are held over the offshore Yolla and Thylacine fields, and a retention lease is held adjacent to the Yolla field. The Yolla and Thylacine gas-condensate fields together currently provide (through gas pipelines to Victoria and thence to Tasmania via the Tasmanian Natural Gas Pipeline) about 25% of Victoria's and Tasmania's total gas demand.

The BassGas consortium, headed by Origin Energy Resources Limited and AWE Petroleum Limited, holds the Yolla gas-condensate field in the Bass Basin. The production infrastructure includes a production platform, two development wells and an undersea pipeline to an onshore

TASMANIAN OFFSHORE ACREAGE AND ONSHORE PETROLEUM EXPLORATION LICENCES

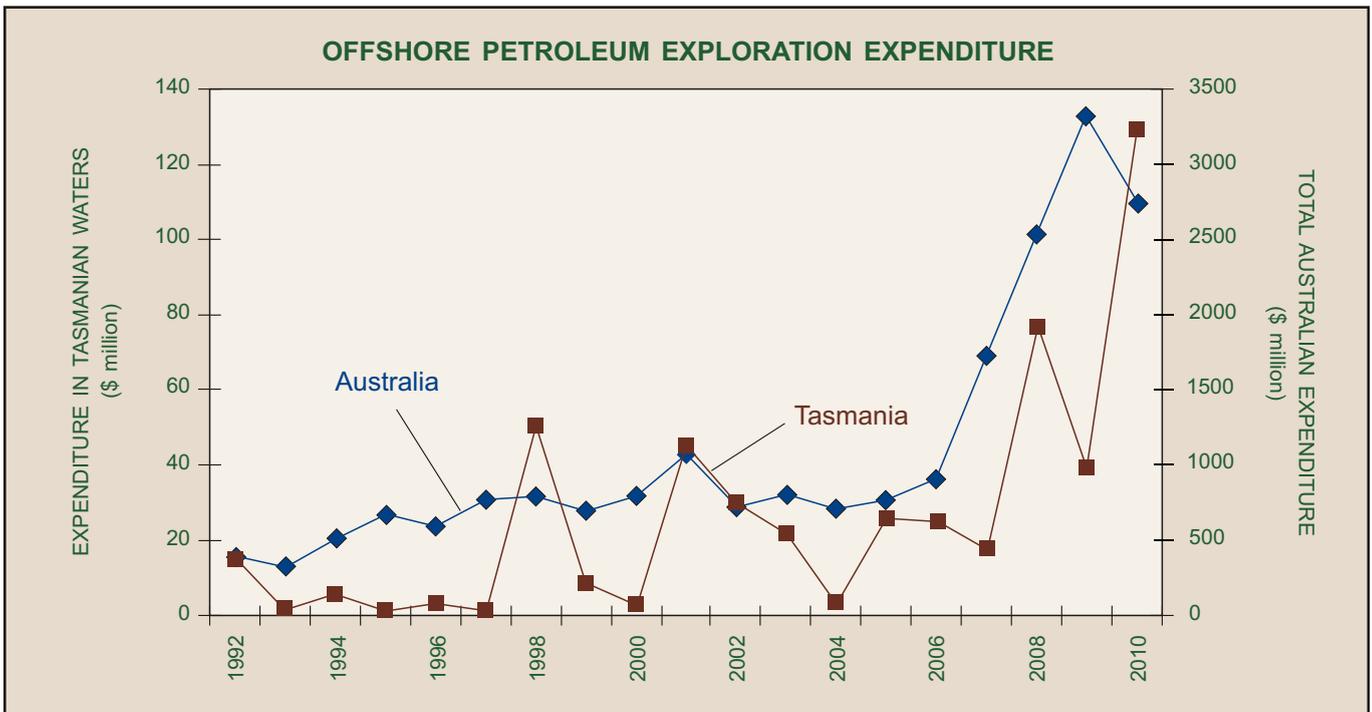


processing plant near Lang Lang in Victoria. Commissioning was completed in late 2006.

Woodside Energy Limited, on behalf of the Otway Gas consortium, was granted a production licence in July 2004 for the development of the Thylacine gas field in the Otway Basin, northwest of King Island. The Thylacine platform and undersea pipeline were installed in late 2005, and drilling from the platform began with Thylacine South-I, a deviated exploration well that successfully proved a southern extension to the Thylacine field. An additional production licence was subsequently granted to allow production from the southern extension. Four development wells were completed by October 2006, and gas from the field is piped to a processing plant near Port Campbell in Victoria. Origin Energy Resources Ltd and Benaris Petroleum NV purchased

Woodside Energy Ltd's share of the Otway Gas operation in early 2010.

During the year, the Spikey Beach-I exploration well was drilled in permit T/38P (Bass Basin) by a joint venture between Beach Petroleum Ltd and Benaris Petroleum NV, using the semi-submersible drilling rig *Ocean Patriot*. Somerset-I was drilled with the same rig in permit T/34P (Otway Basin) by Woodside Energy Ltd. Both these wells were dry, although the deeper reservoir objectives in Somerset-I were not reached due to operational issues. Origin Energy Resources Ltd successfully appraised the Trefoil gas field in the Bass Basin with the drilling of Trefoil-2 in T/18P, using the semi-submersible drilling rig *Kan Tan IV*. After completing this well, *Kan Tan IV* was moved to a nearby site in T/18P to drill the Rockhopper-I



exploration well. Rockhopper-1 discovered oil and gas, and a side-track well, Rockhopper-1 ST1, was then drilled to evaluate the volumes of hydrocarbons present. The commercial significance of this discovery is still being appraised. The Trefoil and Rockhopper fields lie 40 km west of the Yolla field, and may be developed in future by sub-sea tieback to the Yolla platform.

No seismic surveys were undertaken during the year. Total Tasmanian offshore petroleum exploration expenditure for 2009/2010 was approximately \$129 million.

The *Offshore Petroleum Act 2006* was replaced by the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* on 21 November 2008. Progress was made on consolidation of the regulations under the new Act. Progress was also made towards the implementation of a National Offshore Petroleum Regulator (NOPR) similar to the National Offshore Petroleum Safety Authority (NOPSA).

Cataloguing of sample collections related to offshore petroleum exploration continued during the year, with 97 reports being received during the year and indexed. Open-file exploration reports can be viewed and downloaded from the MRT website. Staff attended interstate meetings of the Environmental Assessors Forum, the Petroleum Data Consultative Group and the Upstream Petroleum Subcommittee.

Onshore, a special exploration licence is held for petroleum exploration in northern Tasmania by Overseas Energy Holdings Limited (OEHL), and an exploration licence in central Tasmania is held by Great South Land Minerals Limited. OEHL drilled a dry well, Westwood-1, during the year.

Tasmanian Natural Gas Pipeline

Babcock Brown Infrastructure (BBI) acquired the Tasmanian Natural Gas Pipeline (TNGP) from Alinta DTH Pty Ltd on 1 September 2007. Powerco Tasmania Pty Ltd, which is owned by BBI, is the day-to-day manager of the pipeline.

The TNGP transports natural gas from Longford in Victoria to Bell Bay, Hobart and Port Latta via approximately 740 km of onshore and offshore pipeline. The gas is sourced mostly from the Gippsland Basin in Bass Strait and made available, via the TNGP, to industrial and domestic markets in Tasmania.

The TNGP project expands the gas market in southeast Australia. Ten permanent staff are based in Tasmania to operate the pipeline.

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.

A set of landslide maps for the region from Devonport to Boat Harbour Beach on the North West Coast, conforming to the Australian Geomechanics Society Landslide Risk Management Guidelines for zoning, has been completed. This area is renowned for the high incidence of landslides, particularly close to the coast where there is increasing pressure from urban development. The landslide maps are intended to improve land-use decisions by regulators and other stakeholders. A two-day workshop was held in Ulverstone as a handover exercise to ensure that the new information was understood by the key stakeholders. The invited attendees included local government and geotechnical practitioners, and one of the outcomes was

the recognition that the current planning reforms will benefit from the inclusion of the new mapping and assistance from MRT. 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). The project won the Tasmanian 2010 Australian Safer Communities Award, State Government category.

Work has commenced on a similar mapping project along the northern Tamar Valley. This area has a well known 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.

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 2300 records from throughout Tasmania. The database has become web enabled and publicly accessible.

MRT continues to coordinate the ongoing monitoring of the School Creek landslide in Hobart and the Lawrence Vale landslide in Launceston. Regular inclinometer surveys provide information for the management of these areas and their surrounds. The first records of movement have been detected on the Tarooona near real-time monitoring system, with approximately 36 mm recorded on the School Creek landslide. MRT assisted the Kingborough Council with drafting a funding application to the Natural Disaster Resilience Programme to undertake further studies on the Tarooona landslide and to formulate a long-term management plan.

Tsunami

MRT, in conjunction with Geoscience Australia, completed a suite of work addressing tsunami hazard in Tasmania. The work culminated in the release of a report documenting historical tsunami reports in Tasmania and an independent external peer review.

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 drawn from the Data Management, Royalty, Finance and Administration, and Information Systems and Geophysics branches.

The main activities of the branch in the 2009/2010 year were:

- ongoing maintenance and development of the TIGER (Tasmanian Information on Geoscience and Exploration Resources) System;
- geoscientific data management;
- spatial tenement management services;
- scientific editing and publishing of a range of geoscientific reports;
- management of mineral exploration report accession, circulation and custodianship;
- providing geoscientific information resources to MRT staff and external clients;
- development of a three-dimensional model of northeast Tasmania as part of the *TasExplore* project;
- supporting the information technology environment in MRT;
- migrating data into the TIGER System;
- preparing materials for MRT promotional activities; and
- 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:

- implementing an enhanced map viewer throughout the MRT website and within the internal TIGER applications;
- output of one new and sixteen revised 1:25 000 scale map areas as part of the *TasExplore* project;
- release of the second edition of *Alluvial Gold in Tasmania*;
- delivery of mineral occurrence and drill hole information using web services;
- introducing significant improvements into a number of TIGER modules;
- building an increased information skills-base for MRT staff; and
- completing a major revision of the Tasmanian gravity database.

Geophysics

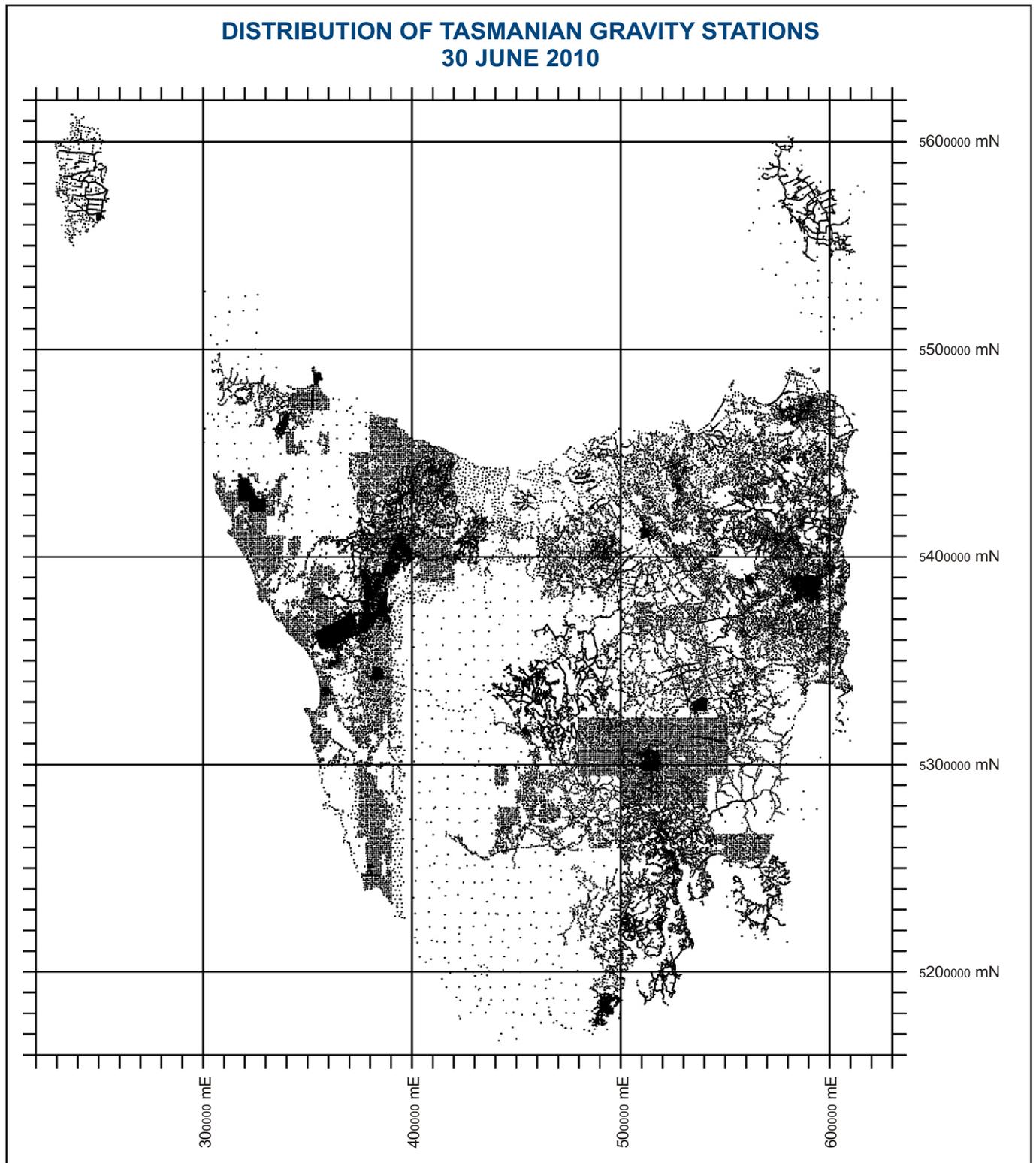
The *TasExplore* project, under which new airborne and ground geophysical data was acquired over northeast Tasmania and the Furneaux Group, was completed on 30 June 2010. Existing drilling and geological information has been synthesised and a three-dimensional model of an area west of the Scottsdale Batholith is being prepared to better define the Mathinna Group–granitoid interface and ultimately to allow the geological interpretation to be tested against the geophysical data.

A technical working group with members from Geoscience Australia, GeoScience Victoria and MRT met in June 2010 to develop the scope and working arrangements for a National Geoscience Agreement to develop a three-dimensional geological model of southeastern Australia. The datasets, software and methodology to be used have been agreed and work will commence following signing of the formal agreement.

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 now 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 535 open and closed-file gravity readings were added to the Tasmanian database which now contains

a total of 81,921 stations distributed as shown below. 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 several new stations. The heights of all stations in the Tasmanian database have been checked against the State digital elevation model and those with a height error of greater than 50 metres have been corrected to be more consistent with the topography, access, nearby stations, and in some cases old field maps. Geoscience Australia was able to locate a number of the field aerial photographs from the 1973 BMR helicopter gravity survey of Tasmania and these were used to correct



the positions of a large number of stations for which new terrain corrections were then calculated. Geoscience Australia has been provided with all updated data.

Marine gravity data for the Bass, Gippsland and Otway basins were acquired from GeoScience Victoria and have been corrected and integrated with the Tasmanian gravity database to provide a seamless coverage including both King Island and Flinders Island. A residual gravity anomaly was calculated using the combined dataset and the Bouguer data, residual data and Tasmanian magnetic coverage have been wormed by Geoscience Australia.

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.

The GDA94 datum has been implemented across the TIGER System and on the MRT website. In most modules spatial location information is retained with the original values as entered and a corresponding spatial data object created with un-projected GDA94 values.

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 9796 GB was downloaded from the MRT website this year compared to 5602 GB last year; this increase is assumed to reflect a continuation of the explorer focus on office-based studies in preparation for higher levels of field activity as financial constraints lift. The number of visits per day has also risen substantially to an average of 836 from last year's average value of 368 over the course of the year.

Major enhancements to TIGER this year included completing implementation of the new map viewer client across both the MRT internet site and throughout the internal TIGER applications, development and implementation of customised forms for licence and lease processes, dynamic publishing of ERA information on the MRT website, development of a petrophysical module in TIGER, and delivery of TIGER mineral occurrence data using GeoSciML and OGC web services as part of AuScope.

IT systems

New PCs are purchased with the Microsoft Windows XP operating system. All desktop PCs run Microsoft Office 2007. For spatial analysis MRT uses both ESRI products and MapInfo. The use of MapInfo and extensions has increased during the year. There has been proof of concept testing and limited production use of wireless broadband for field staff 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. Windows servers provide anti-virus, email, intranet and image delivery services to MRT staff. Files on the corporate Unix systems are accessed from PCs using Samba software. 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-DIER email platform early in 2009/2010, providing integrated mail and calendaring functionality across the entire department.

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 mass storage devices for both MRT network use and the MRT website were updated to current models with higher capacity and speed. 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 one Mbit/sec link has been established from Rosny Park to the Mornington core store.

Other application related activities included connection of the new XRF-spectrometer to the network, installation of GoCAD and GeoModeller, making DOS applications usable using a virtual machine, configuration of user's PCs to access the shared Rosny Park fax machine, preparation for a TRIM upgrade, prototyping of a vehicle booking system in MS Exchange using public folders, and repairs to a critical wide-format plotter by scavenging spare parts from a similar but non-functional unit.

As part of the AuScope National Virtual Core Library, a HyLogger instrument was installed at the Mornington core store and this required the establishment of a secure wireless network within the store area and changes to MRT's bulk storage and Oracle environments to accommodate the data storage, processing and distribution requirements for the hyperspectral data.

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.

Use of the MRT website increased significantly with an average monthly download volume of 816 GB compared to 467 GB last year and a peak monthly download volume of 1261 GB. This reflects a more consistent and greater level of usage. The daily number of visits increased from an average of 368 per day last year to an average of 836 per day this year. 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 OGC 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.

Mineral exploration reports

Capture of metadata summarising technical documents relating to onshore exploration continued throughout the year, with 266 new summaries entered and an additional 331 summaries updated. A high proportion of the reports lodged were associated with either reductions in tenement area or relinquishment of 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 but compliance with the report format at initial lodgement has continued at approximately 95 per cent compared to the target of 100 per cent. This is an improvement over the previous year and appears to correspond to a lower level of activity by explorers and hence reduced volumes of 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 Tasmania all incoming reports continue to be checked to ensure that the geodetic datum used is clearly specified.

Spatial Information Services

During 2009/2010 the capture of 1:25 000 scale digital geological data continued under the *TasExplore* project. This work resulted in the completion of one new map area in northwest Tasmania (Naracoopa).

Also completed under the *TasExplore* project were the data revision and map output of sixteen map areas in northeast Tasmania (Ansons Bay, Beaumaris, Bell Bay, Blue Tier, Bowood, Bridport, Falmouth, Lanka, Lilydale, Low Head, Nabowla, Retreat, Spurr's Rivulet, Tam O'Shanter, The Gardens and Weymouth).

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

The conversion of existing 1:25 000 scale digital geology maps from the AGD66 datum to the GDA94 datum continued. The conversion of the 1:250 000 scale digital geology maps and data has been completed.

The Landslide Map Series for the North West Coast area was completed. Six map themes for each of the four map areas (Devonport, Burnie, Ulverstone and Wynyard) were produced.

CAD continues to be used as a support tool for many projects, with 25 maps and plans and 141 tenement maps and diagrams being produced throughout the year.

Tenement related work included:

- 41 new exploration license applications processed and entered into the MRT spatial tenement information system;
- 46 Exploration Release Area plans produced and entered into the MRT spatial tenement information system;
- 37 new mining leases processed and entered into the MRT spatial tenement information system; and
- the production of maps and data files for 59 proposed 'on ground' work programs for exploration licenses.

A total of 703 hardcopy output products of digital geology and tenement data were produced on demand using the agency's inkjet plotters and 188 data sets of digital geological data were produced for clients.

Information and Access Services — Geoscientific Publications

MRT produces a range of publications 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 2008/2009.
- *Alluvial Gold in Tasmania (second edition)*, by R. S. Bottrill (Mineral Resources of Tasmania 11).

Fifty-eight 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 Record* series during the year:

- 2009/03 — *Geology of the southwestern and north-central parts of the Lyell 1:50 000 scale quadrangle*, by C. R. Calver
- 2009/04 — *Historical accounts of tsunamis in Tasmania*, by C. Mazengarb and M. K. Morris.

Work continued on adding and upgrading entries on the DOMINFO database, with a large number of Archaeological Survey Reports and Department of Mines geological reports 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 and the position is now within the Geoscience Information Branch.

Technical services

This year responsibility for the TASXPLORE process for company report accessioning and circulation was transferred to the Geoscience Information Officer. 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. Direct follow-up with exploration companies is used to request any additional or missing information. Monitoring and managing the change of status of reports from closed file to open file and circulating status reports to managing geologists as appropriate is ongoing.

DB-Textworks books database maintenance and cleanup was ongoing in preparation for making the catalogue available online.

The Inmagic DB/Textworks library management software remained at version 12.00.

Collection

Journal subscriptions were reviewed and seventeen subscriptions were not renewed as a savings initiative. One new journal subscription was added to the collection. Journal subscriptions are now managed by the Geoscience Information Officer to avoid the overheads charged by commercial subscription services.

Work continued on reports not previously entered into the DOMINFO database to ensure scanned copies are available online and to make hard copies available in the library collection.

Electronic access

The combined catalogues of the MRT library and the DIER library were made available from their respective intranet sites using WebPublisher software hosted by the Telecommunications Management Division of the Department of Premier and Cabinet.

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

Online access to journal subscriptions has been 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 within MRT, enquirers from other agencies, 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.

Fifty Exploration Release Areas (ERA), covering 3359 km², were offered to potential explorers by way of the

TasXplorer news sheet, which is circulated widely within the Australian mining community. The posting out of the news sheet was suspended during the period with email, fax and the MRT website becoming the preferred methods of distribution. The news sheet is currently sent to 76 clients of MRT by email (70) and facsimile (6).

Applications were received for areas within fourteen of the advertised ERA's resulting in fourteen exploration licence applications covering 522 km² of ground.

Officers of the section also play a key role in the maintenance of the TASXPLORE and REGIS modules 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 MRT's website.

The *Mineral Resources Regulations 2006*, replacing the *Mineral Resources Regulations 1996*, came into force on 28 June 2006.

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 lodged with Mineral Resources Tasmania during the year ending 30 June 2010, or still in progress, were:

Tarkine National Coalition Incorporated v Gullewa Geothermal Pty Ltd — SEL 9/2009

- Objector considered there was potential for damage to the wilderness values of the Tarkine with the intended exploration. Mediation held and objection withdrawn.

Matthew Carr and Tarkine National Coalition Inc. v Macquarie Harbour Mining Ltd — ELI 1/2009

- Objectors considered that intended exploration would create potential damage to the wilderness values of the Tarkine. Mediation held and objection withdrawn.

Scott Jordan v Tasmania Magnesite NL — 24M/2009

- Objection on grounds of threat to environmental values within the Tarkine Wilderness. Referred to Mining Tribunal. Objection withdrawn prior to hearing.

Mineral Holdings Australia Pty Ltd v Tasmania Magnesite NL

- Objector raised concerns about the royalty agreement with the applicant in respect to production of all metallic and non-metallic minerals. Objection withdrawn prior to hearing.

ZZ Exploration Pty Ltd v Ministerial decision — EL20/2002 and EL30/2002

- Appealed against decision by Minister to refuse application for extension of term. Tribunal ruled that licences be extended until 31 January 2011.

H J White v Great South Land Minerals Ltd — ELI 4/2009

- Objection with regard to access issues. Objection withdrawn after mediation.

D New v Great South Land Minerals Ltd — EL 14/2009

- Objection in respect to monetary issues. Objection withdrawn after mediation.

M & E Phelan v T Kapitany — 25M/2000

- Appeal against registration of caveat on a mining lease. Remains ongoing.

Lease applications, 2009/2010

Total number of all types of exploration rights held as at 30 June 2010

Mineral tenement type	Number	Area
Exploration Licences	192#	54 886 km²
Category 1 (Metallic minerals)	153	10 613 km ²
Category 2 (Fuel minerals)	17	2 162 km ²
Category 3 (Construction minerals)	25	2 147 km ²
Category 4 (Oil – onshore)	3	17 606 km ²
Category 5 (Industrial minerals)	53	3 768 km ²
Category 6 (Geothermal)	7	23 675 km ²
Retention Licences	38#	282 km²
Category 1 (Metallic minerals)	23	82 km ²
Category 2 (Fuel minerals)	5	163 km ²
Category 3 (Construction minerals)	16	68 km ²
Category 5 (Industrial minerals)	18	72 km ²
Prospectors Licences issued	204	N/A
Permits to explore for minerals under the Commonwealth Offshore Minerals Act 1994	-	- 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	1	5 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 2009/2010

Product	Number	Area (ha)
Coal	1	300
Dolomite	1	2
Easement	2	19
Granite	1	2
Gravel	6	115
Magnesite	1	231
Quartzite	1	205
Sand	8	247
Sand and gravel	4	170
Silica	1	200
Stone	4	41
Tin	4	268
Total	34	1 800

Leases granted in 2009/2010

Product	Number	Area (ha)
All minerals and stone	1	108
Clay	1	11
Gravel	4	167
Limestone	1	25
Sand	10	322
Sand and gravel	1	21
Sand and stone	2	103
Stone	4	36
Total	24	793

Total number of leases in force at 30 June 2010

Product	Number	Area (ha)
All minerals	24	18 795
All minerals and stone	4	5 739
Clay	5	94
Coal	3	6 589
Coal and stone	1	175
Copper	1	5
Dolerite	6	1 158
Dolomite	3	140
Easement	16	1 945
Gold	8	834
Granite	3	26
Gravel	161	2 986
Gravel and clay	1	29
Lime sand	3	21
Limestone	6	1 293
Magnesite	1	231
Nickel	2	1 302
Peat	1	9
Quartzite	2	396
Sand	53	2 708
Sand and gravel	25	1 326
Sand and stone	12	639
Sandstone	4	30
Shale	1	32
Silica	3	524
Slate	3	165
Specimens	6	62
Stone	200	4 580
Stone and gravel	21	342
Tin	13	962
Tungsten	1	544
Totals	593	53 681

Mineral Sector Overview

The mining industry in Tasmania was affected by volatile metal prices during the last financial year. Most metals showed strengthening prices during the early part of the year, but only gold, silver and iron ore maintained the upward trend, with prices for other metals at, or slightly above those prevailing at the end of 2008/2009. The outlook for 2010/2011 is optimistic.

Royalty revenue collected for the State by Mineral Resources Tasmania totalled \$34.7 million in 2009/2010, a marked increase from the previous year.

Exploration successes during the year included a significant upgrade of tin and tungsten resources at Mount Lindsay, north of Renison Bell, by Venture Minerals Limited followed by a successful scoping study into a mining operation. A significant zone of tin mineralisation was intersected by the company at the Reward prospect three kilometres to the west. Proto Resources and Investments Limited completed detailed resource development drilling at the Barnes Hill nickel-cobalt deposit near Beaconsfield and work commenced on the preparation of a Development Proposal and Environmental Management Plan.

Four petroleum exploration wells were drilled in offshore Tasmanian waters. Spikey Beach-1 (Bass Basin) and Somerset-1 (Otway Basin) were both dry. The Trefoil gas field in the Bass Basin was further appraised by the drilling of Trefoil-2, while the nearby Rockhopper-1 discovered oil and gas. No offshore seismic surveys were completed during the year. Offshore petroleum exploration expenditure was approximately \$129 million.

Among other mining assets, the China Minmetals Non-Ferrous Metals Company Limited purchased the Rosebery polymetallic mine and the Avebury nickel mine from OZ Minerals Ltd in 2009 and operates through a wholly-owned subsidiary Minerals and Metals Group (MMG).

The Avebury nickel mine remained on care and maintenance throughout the year, but MMG commenced a \$3 million review of the operation in the March quarter, including an 8500 metre drilling campaign to establish more reserves.

The Rosebery mine continued to operate successfully during the year, with a \$1.4 million exploration drilling campaign and a \$23 million project to construct a new ventilation rise resuming.

Bass Metals Ltd continued its profitable open-cut operation at the Que River mine, but this project is winding down, with last ore shipments to Rosebery planned for the September 2010 quarter. Bass has gained approval for

development of the Fossey zone zinc-lead-silver-gold-copper deposit, south of the Hellyer mine. Bass is constructing a decline and plans to commence mining ore at a rate of 400 000 tonnes per annum in late 2010. Concentrates will be produced at the Hellyer mill and there are off-take agreements with Nyrstar.

Grange Resources Limited is expanding the open-cut mine at Savage River. Grange has announced a 25% increase in the price agreed for the iron ore pellets produced at Port Latta.

Metals X Limited has sold a 50% share of its Tasmanian tin operations to YT Parksong Australia Holding Pty Ltd, a partnership dominated by the world's largest tin producer, Yunnan Tin. Operations were profitable during the year. Mining has ceased at Mount Bischoff, but results from a drilling program are being evaluated to determine if a second mining campaign is feasible.

King Island Scheelite Limited has recalculated resources for a higher grade underground mining operation instead of the expanded open cut originally envisaged. Test work has shown that scheelite recovery by whole-ore flotation is feasible.

Bendigo Mining Limited (now Unity Mining Limited) has purchased the Henty gold mine and is conducting a major exploration program to extend the mine's life, while developing new production areas in the mine and upgrading equipment. BCD Resources has discovered a new high-grade ore zone in the Tasmania (formerly Beaconsfield) mine and has increased gold resources by 66,000 ounces of gold.

Copper Mines of Tasmania is examining the feasibility of developing the Western Tharsis deposit. Production was halted from late August to late October following a mud flow into the Prince Lyell mine, following a period of exceptionally heavy rain.

The receiver of Van Dieman Mines Pty Ltd has advertised an information memorandum on the alluvial tin assets in the Gladstone area with a view to attracting a purchaser.

Tasmanian Advanced Minerals Pty Ltd continued silica flour extraction from tenements at Corinna and Blackwater and continued silica flour treatment operations at its plant near Wynyard. The company has recently lodged a Mining Lease application in the Hawkes Creek area.

The Thylacine and Yolla gasfields are both in Tasmanian waters. Thylacine commenced production in September 2007, while Yolla began production in October 2006. The gas from both of these fields is piped to Victoria.

Value of the Tasmanian Mineral Industry

Year ended Commodity	Unit	30 June 2009† Total Quantity	30 June 2010 Total Quantity
Metallic Minerals			
Copper (assayed)	(tonne)	30 655	25 593
Gold (assayed)	(kilogram)	7 617	4 595
Iron ore pellets	(tonne)	2 184 389	2 359 127
Iron (in magnetite)	(tonne)	155 725	126 666
Lead (assayed)	(tonne)	39 409	25 704
Scheelite	(tonne)	17	11
Silver (assayed)	(kilogram)	100 928	87 417
Tin (assayed)	(tonne)	3 880	5 956
Zinc (assayed)	(tonne)	92 742	83 565
Nickel (assayed)	(tonne)	1 729	0
Value of metallic minerals		\$1 055 041 068	\$937 822 757
Non-metallic, Industrial and Fuel Minerals			
Clay — Brick	(tonne)	33 691	40 322
Other	(tonne)	0	0
Kaolin	(tonne)	11 523	7 946
Dolomite — Agricultural	(tonne)	54 541	35 874
Chemical and metallurgical	(tonne)	16 269	43 526
Limestone — Agricultural	(tonne)	100 654	124 399
Cement	(tonne)	1 883 235	1 726 609
Chemical and metallurgical	(tonne)	22 353	14 234
Other	(tonne)	55 960	52 304
Silica (glass and other)	(tonne)	138 371	116 551
Silica (metallurgical)	(tonne)	44 955	54 083
Coal (run of mine)	(tonne)	578 548	621 988
Coal (washed)	(tonne)	433 810	378 785
Peat	(m ³)	*	5
Gemstones	(kg)	‡	‡
Value of non-metallic, industrial and fuel minerals		\$53 603 739	\$78 244 160
Construction Materials			
Building stone — Freestone	(tonne)	563	729
Other	(tonne)	7 765	10 654
Sandstone	(tonne)	473	1 976
Crushed and broken stone —			
Basalt	(tonne)	1 059 815	1 052 313
Dolerite	(tonne)	1 300 731	1 339 720
Limestone	(tonne)	58 348	122 993
Sandstone	(tonne)	650	308
Other	(tonne)	166 178	200 162
Gravel (aggregate)	(tonne)	45 085	31 146
Sand	(tonne)	579 747	681 952
Other road materials	(tonne)	1 960 875	2 160 926
Value of construction materials		\$63 327 739	\$72 201 446
Total value with Australian metal prices		\$1 171 972 546	\$1 088 268 363
Value added production from Tasmanian and other ores		\$1 279 030 826	\$1 304 892 576
(aluminium, cadmium, cement, lead-copper, ferromanganese, silicomanganese, sinter, sulphuric acid, superphosphate, zinc)			
Total value of mining and metallurgical production		\$2 451 003 372	\$2 393 160 939

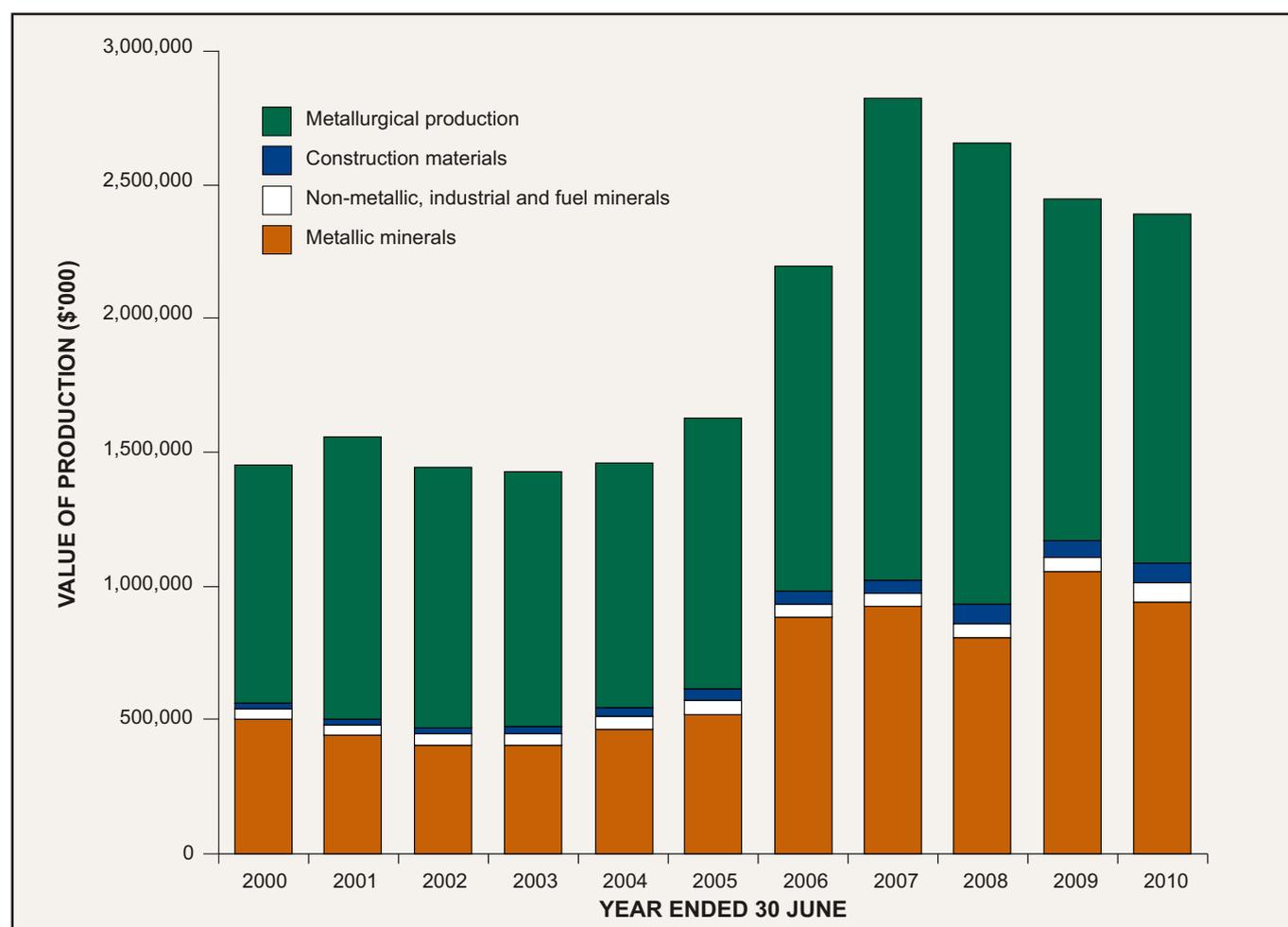
† Figures for 2009 may vary from previously published results because of late or amended returns

* Peat — production less than one tonne

‡ Gemstones — value only recorded

Value of Production, 2008/2009 and 2009/2010

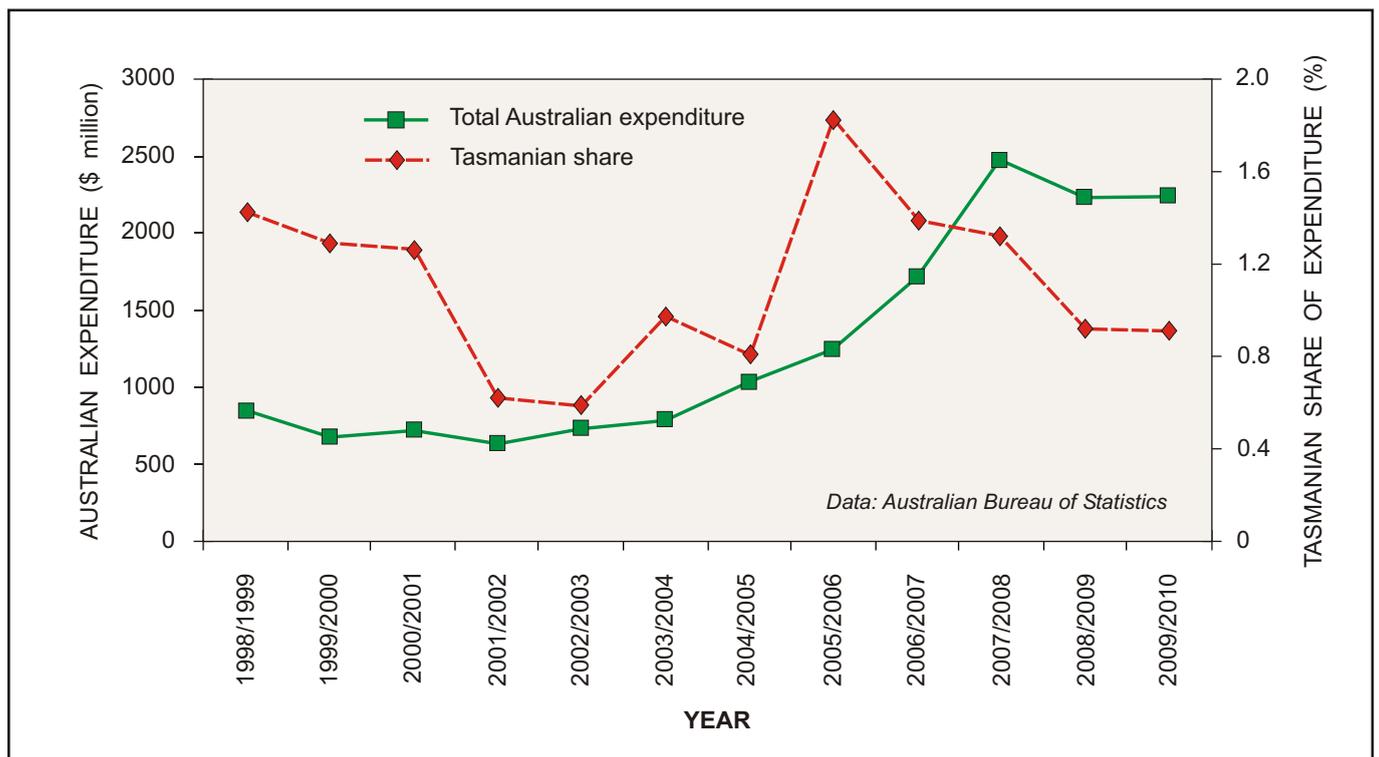
	2008/2009		2009/2010		% Change
	Tonnes	A\$'000	Tonnes	A\$'000	
Copper	30 655	–	25 593	–	-16.5
Gold	7.6	–	4.6	–	-39.5
Iron ore pellets	2 184 389	–	2 359 127	–	+8.0
Lead	39 409	–	25 704	–	-34.8
Silver	100.9	–	87.4	–	-13.4
Tin	3 880	–	5 956	–	+53.5
Zinc	92 742	–	83 565	–	-9.9
Total metallic minerals	–	1 055 041	–	937 823	-11.1
Non-metallic, industrial and fuel minerals	–	53 603	–	78 244	+46.0
Construction materials	–	63 328	–	72 201	+14.0
Value added production from Tasmanian and foreign ores	–	1 279 030	–	1 304 893	+2.0
Value of mining and mineral processing production	–	2 451 003	–	2 393 161	-2.4



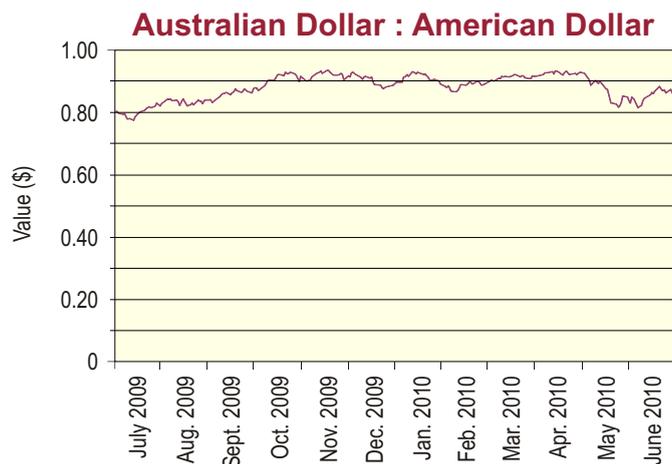
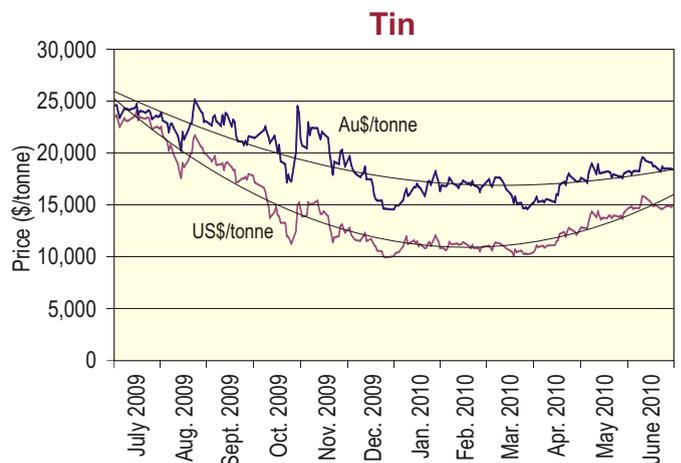
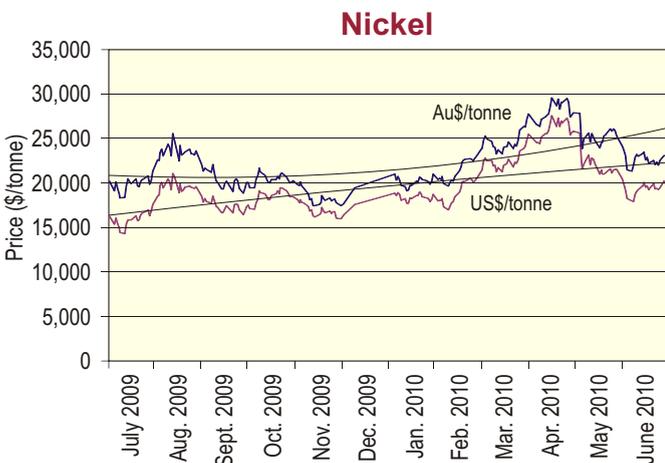
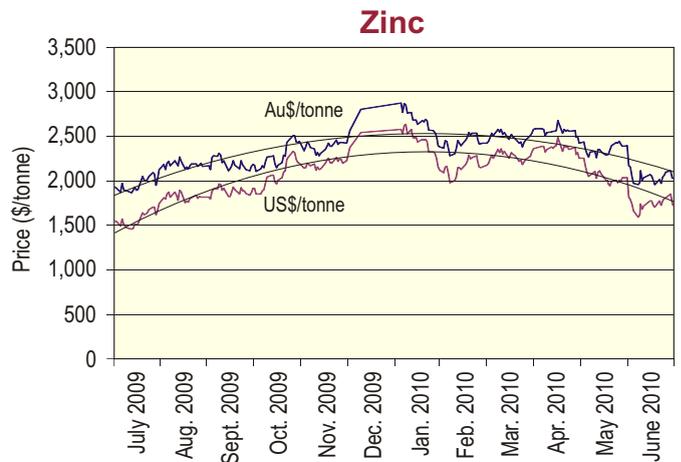
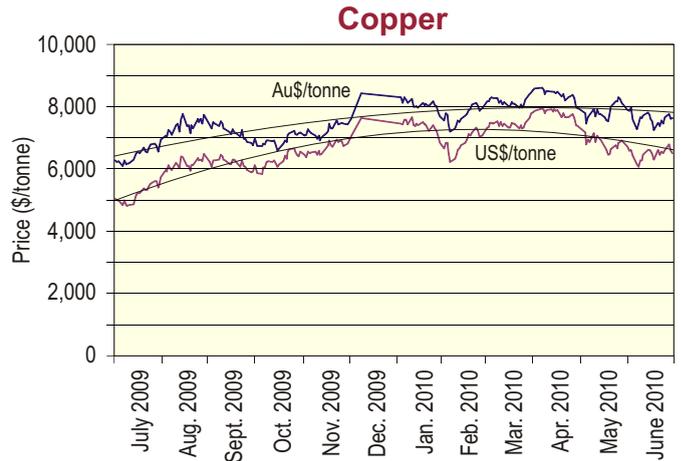
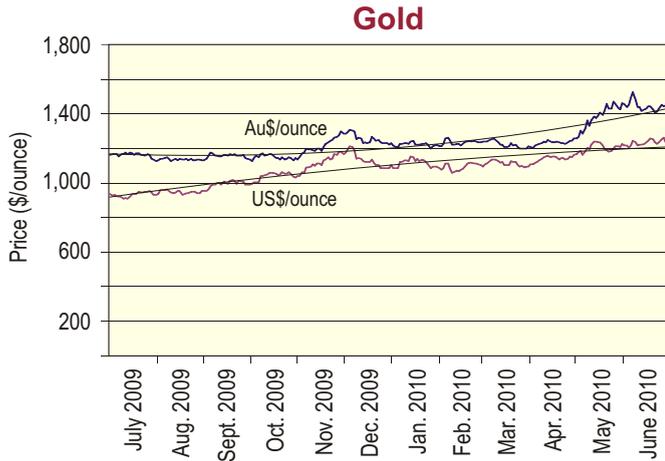
Mineral Exploration Expenditure

Year	Australian Expenditure (\$ million)	Tasmanian Expenditure (\$ million)	Tasmania as % of Australian Expenditure
1998/1999	837.8	11.9	1.42
1999/2000	676.4	8.7	1.29
2000/2001	721.3	9.1	1.26
2001/2002	640.6	4.0	0.62
2002/2003	732.5	4.3	0.59
2003/2004	786.7	7.6	0.97
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

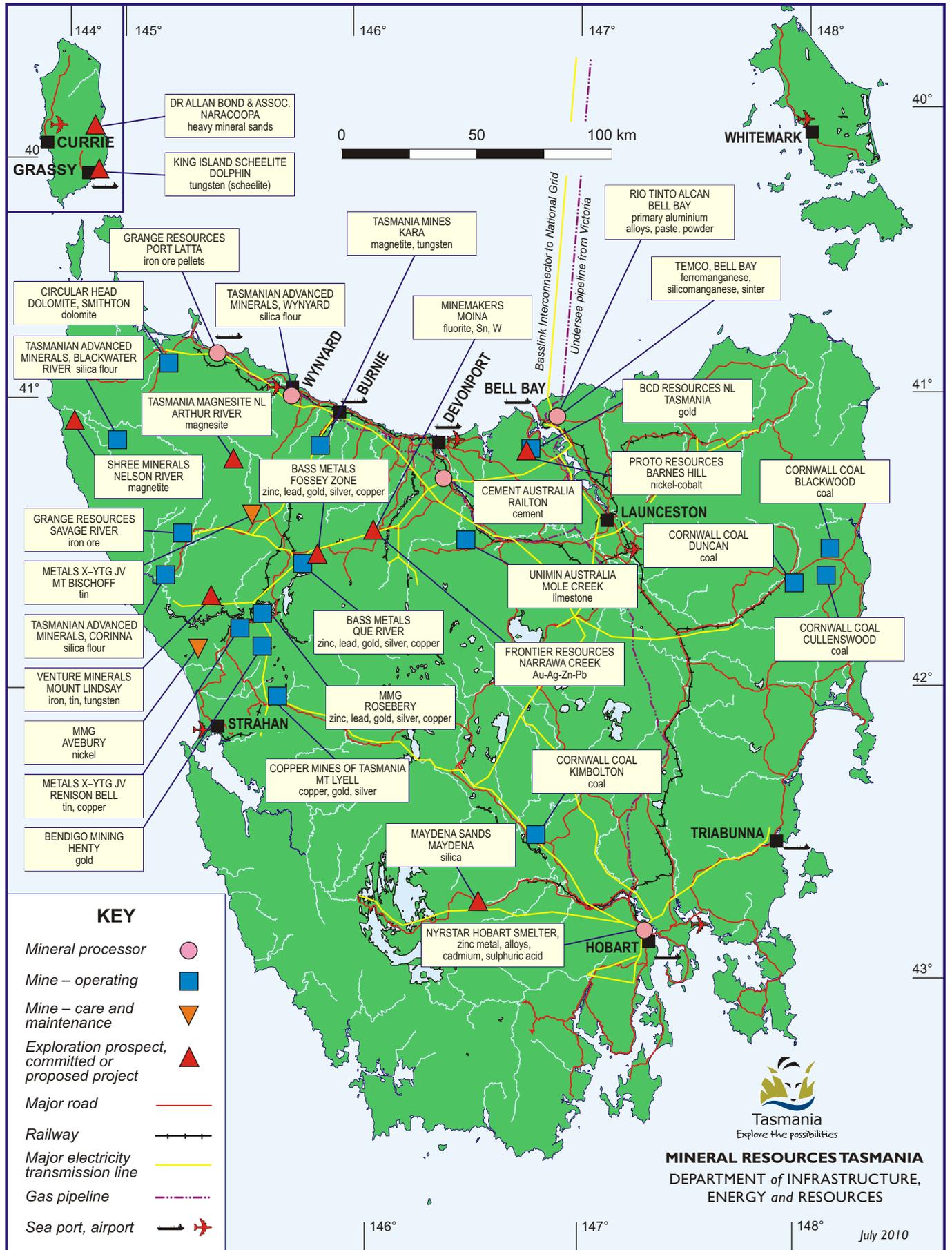
Source: Australian Bureau of Statistics — Actual and Expected Private Mineral Exploration, Australia.



Commodity prices and the Australian dollar



— Tasmania — Major Mining and Mineral Processing Operations and Proposed Projects



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 226 people, comprising 123 permanent staff, 92 permanent award employees, eight limited tenure staff (including graduates), two limited tenure award employees and one casual.

Mine production

Underground ore production totalled 687 426 tonnes at 12.6% zinc, compared to a planned production of 725 000 tonnes of 13.0% zinc. Production from the mine came from K and W lenses with smaller contributions from V and P lenses. Ore in the P lens above 48P level is now depleted and the P lens decline below 45P is closed. The P lens will be re-accessed from the K decline between 50 and 53 levels. Access into the N lens, located 50 m into the hanging wall of K lens, commenced with one ore drive (53N level) mined. Stopping performance in the W lens prompted a redesign of the sub-level interval from 25 metres to 20 metres. No remnant mining from the upper levels occurred.

Mine development

Mine development totalled 4485 metres. This comprised 2427 metres of capital development (184 000 tonnes) and 2058 metres of operating development (178 000 tonnes).

Capital development extended the K decline to 53K level (~1300 m depth) and the W lens decline to 52W (~1200 m depth).

The operating development was mined in K Lens (51–52K levels) and W lens (46–52W levels).

The vertical development for the ventilation upgrade was completed during the year with commissioning expected in the first quarter of 2010/2011.

Mill

The mill treated higher grade ore at lower feed rates during this reporting period. Overall the feed grade was reasonably consistent throughout the reporting period, although grades were lower in the middle of the period. The processing plant available operating hours remained constant from the previous 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 734 000 tonnes, of which 676 050 tonnes were from Rosebery and 58 250 tonnes from outside sources, comprising 52 845 tonnes from Que River and 5405 tonnes from Zeehan Zinc. The overall grade was

12.30% zinc, 3.90% lead, 0.39% copper, 121.78 g/t silver and 1.50 g/t gold. Production totalled:

- 142 733 tonnes of zinc concentrate @ 55.71% zinc.
- 32 925 tonnes of lead concentrate @ 65.48% lead and 1129 g/t silver.
- 7877 tonnes of copper concentrate @ 19.90% copper, 6.33% lead, 3617 g/t silver and 39.9 g/t gold.
- 458 kg of doré @ 36.32% silver and 59.61% gold.

Zinc flotation concentrate production was 142 733 tonnes for the year, with concentrate grade the same as the previous year. The reduction in concentrate production is a consequence of the reduction in tonnes processed.

Lead concentrate production dropped from that of the previous year, which is a direct consequence of the reduction in tonnes processed, while copper concentrate production was higher than the previous year. Doré production was down marginally at 458 kg for the year.

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 Identified Mineral Resources and Ore Reserves*. Mineral resources quoted are inclusive of the reported ore reserves.

The Rosebery mine lease resource inventory at the end of March 2010 shows an overall increase of 2.7 million tonnes compared with 2009. The main reasons for the increase are:

- Re-interpretation of the measured, indicated and inferred resource of P Lens (0.37 Mt);
- Re-interpretation of the measured, indicated and inferred resource of K Lens (0.48 Mt);
- Re-interpretation of the measured, indicated and inferred resource of W Lens (2.56 Mt).

The Identified Mineral Resources as at March 2010 comprised:

Category	Tonnes (000's)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
<i>Rosebery:</i>							
Measured	4 586	4.0	13.9	0.5	142	2.1	9.9
Indicated	7 573	3.8	11.2	0.3	140	1.8	8.3
Inferred	4 674	4.2	10.7	0.3	122	1.5	6.4
Meas + Ind + Inf	16 822	3.9	11.8	0.4	135	1.8	8.2
<i>South Hercules:</i>							
Measured	977	1.5	3.1	0.1	133	2.44	4.3
<i>Global</i>							
Meas + Ind + Inf	17 799	3.8	11.3	0.4	135	1.8	8.0

Note: Discrepancy may be caused due to rounding factors

The Identified Ore Reserves as at March 2010 comprised:

Category	Tonnes (000's)	Pb (%)	Zn (%)	Cu (%)	Ag (g/t)	Au (g/t)	Fe (%)
Proved	1 279	3.7	13.6	0.44	131	1.9	7.1
Probable	4 627	3.7	10.8	0.31	139	1.6	6.3
Total	5 907	3.7	11.4	0.34	137	1.7	6.4

Total ore reserves at Rosebery have increased by 2.8 million tonnes, due mainly to resource increases in P, K and W lenses. Positive changes to the reserve were due to:

- Increase in resource confidence, in particular the W lens and N lens.
- Redesign of the whole mine was undertaken in March 2010, optimising stope and development designs.

Negative changes to the reserves were due to:

- Stopes with a NSR value below \$175 were removed from the reserves.
- Stopes and development in E and F lenses were removed from the reserves. The confidence of extracting this material was considered too low for it to be included in reserves.
- Depletion due to mining:
 - K Lens continued;
 - P panel completed;
 - W panel was initiated;
 - V Lens is nearing completion.
- Mining depletion accounted for a downgrade of 656 000 tonnes.

There are no reserves outside of the Rosebery mine.

Rosebery mine lease exploration

No geological mapping was carried out during the reporting period. Whole-rock geochemical samples were collected from hole 384R and associated daughter holes.

No geophysical programs were conducted during the reporting period. A petrophysical study was initiated within the reporting period to characterise various aspects of the Rosebery sequence.

Geology related environmental activities

The existing Mt Black track, previously utilised to access the Ericsson tower, was widened to allow access to the UDR1500 for the X Deeps drilling program. As part of these works 100 metres of new track was constructed and a drill pad placed under guidance from a flora and fauna assessment conducted by GHD.

An access track was extended from existing tracks for 500 metres and two drill pads were constructed for the diamond drilling program at Jupiter in October. All activities were conducted under guidance from a flora and fauna assessment conducted by GHD.

Diamond drilling

There were 158 diamond holes drilled for a total of 29 019.5 metres during the period 1 April 2009 to

31 March 2010. Expected drilling rates of twenty metres per shift per rig average were seldom achieved during the reporting period, largely due to staffing issues on the drill rigs and underground delays. Whilst major improvements were seen early in the year with a reduction of down-time attributable to mine delays (e.g. fumes, ventilation etc.), there was an increase in downtime in the latter half of the year.

The majority of drilling during 2009/2010 has been resource infill drilling for upgrading confidence levels for parts of V, K, P, N, W and Y lenses.

Surface exploration drilling was conducted to the north and down-dip of current known mineralisation. The hiatus in surface drilling until November was attributed to global circumstances. In September 2009 Project Aegis, a major growth project worth \$20 million, was proposed and approved to increase the mine life well beyond 2020. Surface drilling was reinstated in November as part of this project, focussing on the 2250 mN to test the fertility of host rocks to 80L where current workings are at 53L. Testing the amenability of the host rocks to mineralisation at this depth provided a revised focus for exploration drilling. A mine life beyond twenty years is intended to attract significant capital investment to change core processes at the Rosebery mine.

'Project New Horizons' is an MMG Rosebery internal project which will entail deep drilling from numerous underground locations, including the 48XYO exploration drive, currently being developed, 52W exploration drive planned for 2010/2011, 53K exploration drive planned for 2010/2011, and the 54X exploration drive planned for 2012. These drives will provide access to deeper areas in K, W, N, P, V and X lenses.

Capital expenditure

A total of \$29.4 million was spent during 2009/2010. Major items included \$11.2 million on underground development and \$5.62 million on the ventilation upgrade.

Health & safety

MMG Rosebery mine obtained AS4801 certification in September 2007 which has been maintained throughout 2009/2010. The Safety Management System has undergone continuous improvement since this time with increased training and awareness on hazard identification, revised job safety observation program, and additional communication and consultation processes.

The Wellness Program has continued to align with site H & S 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.

MMG Rosebery mine recorded two lost time injuries in 2009/2010. The first occurred in August 2009 and involved an employee who sustained an ankle injury when he fell down a rill of dirt whilst checking breakthrough holes underground. The second occurred in June 2010 when a visiting contractor was conducting gantry crane inspections

in the concentrator and tripped and fell on an inspection platform and broke his leg. The All Injury Frequency Rate (AIFR) 12-month rolling average was 95.9 as at 30 June 2010, a significant decrease from 172.3 recorded at 30 June 2009. The decrease in AIFR over the past twelve months is a reflection of the injury prevention strategies being implemented on site resulting in improving site performance.

The AIFR improvement was supported by the implementation of proactive measures over 2009/2010, including the introduction of the DuPont Safety Resources program for managers, leaders and general employees and contractors to embed our safety principles across site and strive towards making safety a value rather than a priority. This program involves training in job safety interactions as well as one-on-one mentoring/coaching with managers, superintendents and frontline supervisors across the site. The weekly manager's safety walkabouts to reinforce the safety standard expected across site and the Extreme Safety Focus quarterly programs have also continued.

Environment

MMG Rosebery established a new environment team in 2010 to improve current environmental management and to progress management and rehabilitation of legacy sites. The team comprises six positions, with the environment manager reporting to the site General Manager.

Five non-compliance events were reported to the Tasmanian Government during the 2009/2010 year, with all of these occurring prior to December 2009. The reportable events included two exceedences of the zinc criteria in wastewater discharge to Lake Pieman, one controlled and one uncontrolled discharge of wastewater from the No. 2 and No. 5 dam system (2/5 dam) to the Stitt River, and one uncontrolled discharge of effluent from the site effluent treatment plant (ETP) to Rosebery Creek during a power outage. All incidents occurred during high rainfall events. A number of controls have been implemented to address each of the incidents and site drainage management continues to be a focus for the operation.

A significant wastewater management project was initiated in 2010 which has improved understanding of site hydrology. The project reviewed existing wastewater and stormwater infrastructure and made recommendations to improve wastewater management. The key recommendation that has been adopted is the installation of a stormwater surge pond that will improve control of water during high rainfall events and allow regulated discharge of stormwater to the ETP. This will reduce the risk of the ETP overtopping. The capacity of the proposed pond is 10 000 m³ which will allow the site to manage a 1 in 20 year storm event. Other water management projects included:

- Development and implementation of production shutdown procedures during high rainfall events to prevent overflow at the ETP.
- Installation of a backup generator for the ETP pumps during power outages.

- Installation of a return water diversion system at the 2/5 dams to reduce the load on the ETP during high rainfall events.
- Diversion of clean stormwater to stop it entering the site and becoming contaminated.
- Use of stormwater to replace raw water previously taken from Lake Pieman for production.

In the previous annual report it was stated that a lime dosing plant was established at 2/5 dam and that water quality had been improved in this system. It was intended to discharge treated water from 2/5 dam directly to the adjacent Stitt River. Ongoing monitoring showed that MMG was unable to maintain the quality of the water to a level that met the discharge criteria set by the Environment Protection Authority. Water from 2/5 dam is currently being pumped to the ETP where it is treated and discharged at the site's licensed water discharge point.

Historically, stormwater from the open-cut area (4 Level) of the Rosebery site discharged to Rosebery Creek which flows through the Rosebery township. Attempts had been made to manage the quality of this water, including installation of settlement ponds and limestone drains, but the quality remained poor. In 2010 drainage across the open cut was realigned to divert all stormwater from the area down into the site's existing wastewater system where it is treated at the ETP. This has increased the stormwater load on the ETP but will improve the quality of water within Rosebery Creek. MMG will continue to monitor Rosebery Creek.

Dust management remained a key focus in 2009/2010 with MMG installing a train wash system at its train loading facility. The system includes spray curtains to control potential concentrate dust and a wash system to remove concentrate residue that previously remained on the wagons following loading of concentrate. The project has reduced the risk of concentrate being distributed off-site into the environment. Wash water is collected and pumped to the site's existing wastewater system.

MMG Rosebery's Environmental Protection Notice (EPN) requires MMG 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 called ESDAT. This system allows all data from laboratories to be automatically imported into the database. The system automatically highlights exceedences in set criteria, allowing the environment team to identify and manage issues as they occur. Historic data is progressively being uploaded to the system and data quality management has improved.

Stage 7 works at the Bobadil tailings storage facility commenced in 2010 with reinforcement of buttressing on the western and southern embankments. This has set the groundwork for future lifts of the embankment, with a two metre lift scheduled for 2011. Extensions to the rock quarry were made with sixteen blasts required to provide rock fill for the buttress. Current projections show that capacity at Bobadil will be exhausted by 2015 and work is continuing on developing future tailings storage options.

MMG was granted a permit to undertake mining from a test pit at its South Hercules site near Mt Hamilton. Preparation works included an upgrade of the Mt Read Road and an access track from Mt Read Road through to Hercules and South Hercules. Road construction has been undertaken in accordance with the *Forest Practices Code 2000* and has improved drainage along the existing track. Impacts to sensitive vegetation identified in the area were minimised. Where sensitive vegetation needed to be removed it was translocated, with translocated plants being mapped and tagged so that the success of this work can be monitored.

Noise and vibration monitoring continued within the Rosebery township following continued upgrade of the monitoring equipment.

MMG Rosebery underwent two surveillance audits for its ISO14001 Environmental Management System in 2009/2010 and continues to maintain its certification.

Community Relations

Lead in the community

A letter-drop to the community was undertaken on 21 December 2009 advising residents of the Rosebery Environmental Sampling Program to collect baseline data following concern about heavy metals in the township. Soil, surface water and dust screening for a suite of metals was undertaken in three key areas — properties MMG owns and/or occupies; public areas such as schools, parks etc.; and any private houses which residents wished to have tested.

A community Advisory Group on Toxic Metal was formed and chaired by the West Coast mayor. Representatives from the community, government, union and MMG are members. Regular updates to the community on the environmental monitoring program were given by MMG, EPA and DHHS representatives. Final reports are currently being prepared. The Deputy Director of Health confirmed that there is no risk to human health from heavy metals in Rosebery.

West Coast All Schools Tree Day

West Coast All Schools Tree Day 2009 was held in Strahan. The West Coast Weed and Fire Management Group (on which MMG is represented) manage the event. MMG (and formerly OZ Minerals and Zinifex) contributes to the day which is in its third year and travels to a different West Coast town each year.

Safe Work Week

MMG supported a free community safety day held in Rosebery as part of Safe Work Tasmania Week. These sessions provided local businesses and community members access to a series of free health and safety sessions and covered topics such as making your small business safer and healthier, electrical safety in the workplace, discrimination, bullying and harassment, mining hazards and your responsibilities, and electrical safety in the home. Up to 200 participants from across the West Coast attended some or all of the sessions.

MMG Service Awards

The MMG Rosebery 2009 Service Awards were held in October 2009. The awards recognised twenty-one employees who have attained significant milestones in length of service to MMG and past companies (EZ, Pasmaico, Zinifex and OZ Minerals). Invitations were extended to local West Coast recipients of service awards in years gone by. Much positive feedback was received for this gesture.

Memorial and reflection seat

The MMG One Rosebery Leadership Network (ORLN) completed a project to install a conglomerate boulder, plaque and reflection seat recognising the contribution of all those people who have worked and supported the mines in the region. It is also reminder of the value of life. The memorial and seat are near the entrance to the mine site.

Rosebery Business Leaders Workshop

MMG sponsored the Regional Development Company to facilitate a Rosebery community leaders workshop to discuss their vision for the community and to collectively develop priorities for a community action plan. Fifty business leaders attended the workshop.

Quarterly community updates

Quarterly updates to the community on the site's performance in safety and production, upcoming projects and MMG community sponsorship continued and have been well attended by interested community members. The updates allow community members direct access to the MMG Rosebery General Manager and the management team.

Other community support activities included:

- Go Red — Women's Health Day activities.
- Rosebery Community Council Administration subsidy for Community Sports Centre and MMG dedicated section in the post office.
- MMG Award for Excellence, Rosebery District High School.
- MMG Bursary for Science, St Josephs School.
- Health West school children's photographic competition.
- Queenstown Rotary Youth Driver Awareness Program.
- 53rd Rosebery athletic carnival.
- Rosebery children's Christmas parade and Zeehan children's Christmas party.
- Tullah Challenge.
- Rosebery Festival and acquisition of local artwork.
- Merit scholarship for two West Coast students attending the Tasmania Academy in Burnie.
- Major sponsor of Tasmanian Chamber Brass who were selected to represent Australia at the International Society for Music Education International Conference in Beijing, China.

Bass Metals Limited Que River and Hellyer

Bass Metals Limited, through the Que River Mining Alliance with Mancala Pty Ltd, operates the Que River mine. At year end 69 people, comprising 24 staff and 45 contractors, were employed.

Since incorporation in July 2004, Bass Metals Ltd (formerly Resource Finance & Investments) focussed on a strategy of accumulating a substantial land position within the highly prospective Mt Read Volcanics belt (MRV) in western Tasmania. Acquisition of the advanced Hellyer exploration project, including the Hellyer and Que River decommissioned mines, was the first stage of a very successful acquisition process.

Mining operation

A total of 50 474 tonnes of ore grading 15.9% Zn, 8.9% Pb, 236 g/t Ag, 3.5 g/t Au and 0.4% Cu, was mined from the Que River open cut.

Waste stripped totalled 454 564 banked cubic metres (BCM), comprising 155 054 BCM of potentially acid forming material, 150 252 BCM of non-acid forming material, 45 683 BCM of soil/clay, 1 798 BCM of contaminated material, 22 12 BCM of stope fill and 392 BCM of development.

Reserves and Resources

The Ore Reserve (5% Pb + Zn cut-off) as at 30 June 2010 comprised:

JORC Classification	Tonnes ('000)	Copper (%)	Lead (%)	Zinc (%)	Silver (g/t)	Gold (g/t)
<i>Fossey</i>						
Total Probable	824	0.3	5.3	8.9	126	2.4
<i>PQ (Que River)</i>						
Total Probable	12	0.2	7.4	13.2	209	2.6
Total Proved	1	0.3	6.4	10.4	232	4.2
Total Reserves	13	0.2	7.3	12.9	212	2.8
Total	837	0.3	5.3	9	127	2.4

The combined polymetallic massive sulphide mineral resources (5% Pb + Zn cut-off) at 30 June 2010 comprised:

JORC Classification	Tonnes ('000)	Copper (%)	Lead (%)	Zinc (%)	Silver (g/t)	Gold (g/t)
<i>Fossey</i>						
Indicated	690	0.4	6.1	10.4	143	2.5
Inferred	110	0.3	4.3	7.4	106	2.1
Total	800	0.4	5.8	9.9	137	2.5
<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
Measured	160	0.2	3.8	6.5	96	1.2
<i>Que River Pb-Zn</i>						
Indicated	140	0.3	4.2	7.4	104	1.2
Inferred	300	0.2	4	6.9	100	1.2
Total	60	1.7	0.7	2.1	69	0.3
Indicated	260	1.9	1.6	4.3	68	0.3
<i>Que River Cu</i>						
Inferred	60	2.5	0.2	0.6	33	0.2
Total	380	2	1.3	3.4	63	0.3
Measured	60	1.7	0.7	2.1	69	0.3
<i>Total</i>						
Indicated	1,750	0.6	4.5	7.8	106	1.6
Inferred	420	0.6	3.8	6.6	95	1.4
Total	2,230	0.6	4.2	7.4	103	1.5

The Hellyer Tails Mineral Resource estimate at 23 June 2009 comprised:

JORC Classification	Tonnes (million)	Copper (%)	Lead (%)	Zinc (%)	Silver (g/t)	Gold (g/t)
Measured	4.9	0.2	3.1	2.8	105	2.7
Indicated	2.5	0.2	3	2.6	104	2.6
Inferred	2.1	0.2	2.9	1.7	103	2.4
Total	9.5	0.2	2.8	2.5	104	2.6

The Mt Charter Mineral Resource (at 0.7 g/t Au cut-off) at 30 October 2006 comprised:

JORC Classification	Tonnes (million)	Copper (%)	Lead (%)	Zinc (%)	Silver ('000 oz)	Gold ('000 oz)
Indicated	1.9	1.21	36.3	0.7	74	2,218
Inferred	4.2	1.22	35.2	0.4	165	4,754
Total	6.1	1.22	35.5	0.5	239	6,972

Rehabilitation, environmental and pollution control initiatives

The main initiatives and achievements for the period included:

- Material improvements in the quality of water leaving the Hellyer lease.
- Implementation of specific management measures to reduce legacy acid mine drainage including former stockpile area rehabilitation and tailings saturation.
- Interim measures to manage water from the Fossey decline.
- Improved control of water quality leaving the Que River lease over winter through lime dosing upgrades.
- Growing awareness of environmental considerations for exploration and mining activities across both mine leases.

Bass Metals also continues to support several research projects aimed at developing self-sustaining water treatment systems to manage acid mine drainage problems.

Capital expenditure and new developments

The total capitalised exploration expenditure for the period was \$3.87 million. A Definitive Feasibility Study evaluated a new underground mine at the Fossey deposit, with a production rate of 400 ktpa feeding the Hellyer plant to produce approximately 80 ktpa of saleable quality zinc, lead and copper-precious metals concentrates. With EPA and Board of Management approval, construction of the decline began during January 2010.

Copper

Copper Mines of Tasmania Pty Ltd Mount Lyell mine

This company operates the Mt Lyell underground copper mine and concentrator at Queenstown, employing 285 people in operations, comprising 98 CMT salary and wage employees and 187 mining contractors.

Production

Ore mined totalled 1 820 407 dry tonnes, with 2 072 373 tonnes being treated, producing 89 899 wet tonnes of concentrate containing 23 160 tonnes of copper. Waste mined totalled 55 786 tonnes.

Resources and Reserves

The Prince Lyell (1465–1315) estimated ore reserve at 31 March 2010 (1% Cu cut-off grade) comprised:

Classification	Ore (Mt)	Cu (%)	Au (g/t)	Cu metal ('000 t)
Proved reserve (surf stockpile)	0.01	1.25	0.31	0.2
Proved reserve (recovered in situ)	3.0	1.34	0.33	41
Probable reserve (recovered in situ)	1.2	1.42	0.35	18
Probable reserve (from cave)	5.2	1.13	0.28	59
Proved	3.0	1.34	0.33	41
Probable	6.4	1.19	0.29	76
Total reserve	9.5	1.24	0.31	117

The Estimated Mineral Resources at 31 March 2010 (all in addition to Reserve) comprised:

Classification	Ore (Mt)	Cu (%)	Au (g/t)	Cu metal ('000 t)
Prince Lyell below 1315 (Inferred)	3.6	1.35	0.3	48
Prince Lyell–Cave 2092–1465 (Indicated)	1.1	1.45	0.4	17
Prince Lyell–Cave 2092–1465 (Inferred)	9.4	0.90	0.2	84
Western Tharsis (Indicated)	2.9	1.32	0.3	38
Western Tharsis (Inferred)	7.3	1.33	0.3	97
All resources (M, I and Inf.)	24.3	1.17	0.3	285

Environmental and pollution control initiatives

Copper Mines of Tasmania continues with long term environmental improvement programs at Mount Lyell. This work is aimed at reducing CMT's environmental impact within the terms of the CMT Agreement Act, which indemnifies CMT from pollution on the site from activities prior to 1999. Improvement programs during the year included increased security of pipelines to prevent discharge to water courses, increased water recycling to reduce raw water demand, and investigating options for improved performance and to reduce long term impacts of tailings storage. The effectiveness of the environmental improvement programs is reflected in a reduced number of reportable incidents and reduced levels of pollutants measured downstream of the site.

Capital expenditure

The major capital expenditure item was \$4,039,214 spent on mine development.

Gold

BCD Resources NL Tasmania mine, Beaconsfield

At 30 June 2010, the mine had 151 employees plus 71 contractors, for a total of 222 people.

Production

A record 295 403 tonnes of ore at an average grade of 7.2 g/t gold was mined during the year. Ore milled totalled 297 229 tonnes producing 57 758 ounces (1796.5 kg) of gold. A total of 17 375 tonnes of waste was hauled to the surface.

Reserves and Resources

Ore Reserves, as at 30 June 2010, comprised:

Proved Reserve	234 000 tonnes @ 9.4 g/t Au 70 000 ounces contained gold
Probable Reserve	715 000 tonnes @ 9.7 g/t Au 224 000 ounces contained gold
Total Reserve	949 000 tonnes @ 9.7 g/t Au 294 000 ounces contained gold

Resources (including Reserves), as at 30 June 2010, comprised:

Measured Resource	384 000 tonnes @ 12.3 g/t Au 151 000 ounces contained gold
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Indicated Resource	786 000 tonnes @ 11.3 g/t Au 285 000 ounces contained gold
Inferred Resource	277 000 tonnes @ 9.5 g/t Au 85 000 ounces contained gold
Total Resource	1 447 000 tonnes @ 11.2 g/t Au 521 000 ounces contained gold

Drilling during the year intersected new high-grade gold mineralisation in the western zone of the mine. Subsequent drilling has already resulted in 48 000 ounces being brought into reserves in the June 2010 reserve statement. The grade of 8.7 grams per tonne gold is based on conservative assumptions regarding internal waste, and further engineering design work is planned to optimise and increase the reserve grade in this zone.

Environmental projects and initiatives

A major project commenced to increase the capacity of the tailings storage facility No. 2. This is a lined dam that allows the separate storage of benign float tailings and will considerably reduce the risk of contaminated seepage from existing tailings facilities.

Capital expenditure

Capital expenditure during the year was \$6.361 million, comprising \$5.449 million on exploration, evaluation and

mine development, \$512 000 on mining plant and equipment, and \$400 000 on plant and equipment under lease.

Other projects

Enhanced mining

An enhanced mining method is being introduced to replace the footwall driving method currently used in the western zone of the mine, whilst still achieving the safety benefits consistent with geotechnical best practice. During the year two stopes using this new method were successfully developed and extracted. Based on these results, the method will be applied for all future production in the western part of the ore body and ore produced with this method will gradually increase, forming a significant portion of total ore production by the end of calendar 2011. The enhanced method will reduce the amount of development required to access a stoping block by around 60% and reduce the production drilling by around 25%. In addition, the method provides an opportunity to further reduce unit costs through improving productivity, ore recovery and backfill dilution.

Remnants

On the upper levels of the mine, the company has been establishing development for contract and owner-operated mining operations in the high-grade remnants from historic mining. Recent drilling has also confirmed the potential for additional resources in this area.

Stockwork potential

The company completed a scoping study on mining a zone of stockwork gold mineralisation, which had never previously been mined, in the western footwall of the Tasmania Reef. This confirms the potential for a low-cost source of bulk tonnes to utilise spare mill capacity and increase gold production rates. Its presence has been confirmed in the modern mine from 815 to 915 metres below surface and potential for further mineralisation exists above and below these levels.

Unity Mining Limited Henty gold mine

Unity Mining Limited (formerly Bendigo Mining Limited) operates an underground gold mine and treatment plant near Queenstown. Unity is strongly focussed on growth, and particularly within the Henty mine lease and nearby exploration licences, in exploring the potential to extend the existing mine life.

A total of 274 421 tonnes of ore at an average grade of 5.2 g/t gold was mined during the year, with 276 301 tonnes of ore being treated yielding 1343 kilograms of gold and 829 kilograms of silver. Waste mined totalled 94 769 tonnes.

Resources and Reserves

Reserves at 30 June 2010 were 460 000 tonnes at 6.5 g/t gold (Probable), containing 96,000 ounces of gold.

Resources (including Reserves) as at June 30 2010 were 421 000 tonnes at 7.4 g/t gold (Indicated) and 4000 tonnes at 3.9 g/t gold (Inferred) for a total of 425 000 tonnes at 7.3 g/t gold (Indicated and Inferred). There were no resources in the Measured category.

Employment

Total employment of staff and contractors was 190 people, with 103 in mining, 22 in mineral processing and 65 in support services.

Environment and major projects

The 2009/2010 year commenced with a major change in focus for the Henty gold mine. The first half of the 2009 calendar year was committed to the closure of the mine, by the then owner Barrick (Henty) Limited, in December 2009; however the operation was sold as a going concern to Bendigo Mining as of 1 July 2009. From that point on, considerable work was undertaken to ensure continuity of production and build on known existing ore reserves. Bendigo Mining Limited was renamed Unity Mining Limited in December 2010.

Assisting the exploration team in gaining necessary approvals to commence surface exploration activities was a key component of work for the site environment team. A significant surface exploration program commenced early in the year and has continued apace since that time. With the corporate focus on realising the potential of the Henty property, substantial financial commitment has been made to the drilling program.

A review of hydrocarbon-contaminated waste management on site was undertaken during the year and changes are to be implemented during the 2010/2011 financial year to increase the volume of this waste that may be recycled. A similar review of waste oil and diesel management was also undertaken and changes will be made to these processes to ensure that this waste stream continues to be effectively managed.

Capital expenditure

A total of \$9.806 million was spent on capital projects including:

- \$3.482 million on exploration and development geology and lease exploration, particularly near existing mine infrastructure for mine life extensions;
- \$5.214 million on mine development and mobile equipment, accessing the Tyndall ore body, and purchase of additional equipment including a twin boom development drill, underground truck and bogger;
- \$1.100 million on other items and environmental bond.

Iron ore

Grange Resources Limited Savage River mine

Grange Resources Limited operates an open-cut magnetite mine and concentrator at Savage River. Magnetite concentrate is pumped as slurry to Port Latta, where it is converted to iron ore pellets and shipped to market.

A total of 581 people are employed in the operation, including 103 contractors. These are split between the mining operation (320), Savage River concentrator (65), Port Latta plant (105), services (71), and finance (20).

Production

A total volume of 18.885 million bank cubic metres (BCM) of material was mined during the year, including 1.613 million BCM of ore and 17.272 million BCM of waste. Ore crushed totalled 6.069 million tonnes with 2.425 million tonnes of concentrate being produced. Pellet production totalled 2.36 million tonnes with 2.388 million tonnes of pellets and 99 000 tonnes of iron ore chips being sold.

Ore Reserves and Resources

Ore Reserves as at 31 May 2010 comprised:

Deposit	Reserve category	Million tonnes	Grade (% DTR*)
North Pit	Proved	33.86	55.0
	Probable	64.10	51.9
	Total	97.96	53.0
Centre Pit South	Proved	8.22	44.8
	Probable	2.74	39.1
	Total	10.97	43.4
South Deposit	Proved	7.38	43.6
	Probable	1.07	45.7
	Total	8.45	43.9
Stockpiles: crushed ore	Proved	0.09	42.9
	Probable	1.06	28.5
Total stockpiles	Proved	1.16	29.6
Total Ore Reserve	Proved	50.62	51.1
	Probable	67.91	51.3
	Total	118.53	51.2

* DTR = Davis tube recovery, a measure of the mass proportion of magnetite iron ore

Mineral Resources as at 31 May 2010 comprised:

Deposit	Resource category	Million tonnes	Grade (% DTR)
North Pit	Measured	38.05	59.1
	Indicated	84.39	55.3
	Inferred	37.40	54.9
	Total	159.83	56.1
South Deposit	Measured	12.29	44.4
	Indicated	5.57	43.5
	Inferred	11.25	40.9
	Total	29.11	42.9

Deposit	Resource category	Million tonnes	Grade (% DTR)
Centre Pit South	Measured	15.91	49.5
	Indicated	16.24	48.5
	Inferred	22.77	43.1
	Total	54.93	46.6
Centre Pit North	Measured	17.23	55.0
	Indicated	24.44	53.2
	Inferred	15.67	49.0
	Total	57.34	52.6
Centre Pit	Measured	1.79	47.0
	Indicated	1.22	43.8
Southern Extension	Inferred	0.65	44.3
	Total	3.67	45.5
Total Mineral Resource, including stockpiles reported above	Measured	86.42	53.8
	Indicated	131.87	53.5
	Inferred	87.75	48.9
	Total	306.04	52.3

The information on Mineral Resources and Ore Reserves is reported in accordance with the *Australasian Code for Reporting of Mineral Resources and Ore Reserves* (The JORC Code, 2004).

Block models were prepared for each part of the deposit using Surpac software.

The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Ore Reserves. The Inferred Mineral Resources are, by definition, additional to the Ore Reserves.

A lower cut-off grade of 15% DTR was used in the calculation of both the Mineral Resources and Ore Reserves.

The Ore Reserve was calculated using a 1.087 dilution factor and a mining recovery factor of 0.939. These factors are based on periodic reconciliation specific to mining areas.

Environment and rehabilitation activities

Contract weed management continued around the mine and town area in partnership with the Savage River Rehabilitation Project. New broom growth is again considerably down on previous years other than an area on the eastern side of the entrance road. In an effort to bring pampas under control helicopter spraying was contracted for the Centre Pit area. These areas had limited or no ground access. The helicopter spraying was extremely effective and economic when the area covered was taken into account.

In situ classification and segregation of waste rock from pits has continued. Waste from North Pit went to the Broderick Creek Dump. The flow through continues to extend north and west. The classification system was audited internally this year and training for grade controllers continued.

Grange has continued to assist local Coastcare and Weed Management strategies at Port Latta and assisted with work in the Tatlows Beach area close to Stanley.

Dust deposition at Cowrie Point and Crayfish Creek is measured by high volume air sampling with selective PM¹⁰ inlets. The annual averages were 24.20 g/m³ at Cowrie Point and 22.70 g/m³ at Crayfish Creek. Refurbishment of the existing machines meant that the Crayfish Creek unit was off line for part of the year. Following inspections it was decided to replace the units entirely in the coming financial year.

Water quality in the Savage River from Grange's operations was satisfactory. Improvement in the Savage River water quality continues through projects associated with the Savage River Rehabilitation Project.

Capital expenditure

A total of \$6.365 million was spent on capital items during the year. Major items included \$1.7 million on D45KS drill rig # 3, \$0.661 million on production excavators, \$0.763 million on refurbishment of the ST31 stacker, \$0.46 million on electrical upgrades at Port Latta, \$0.35 million on replacement of 789C trucks and \$0.310 million on accommodation upgrades.

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 ore 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.

Mining operations consist of the mechanised excavation of weathered (oxidised) ore and overburden and blasting of fresh ore and waste with production blast holes. The mine utilises uniform ten metre bench heights with 70° bench faces and an operating bench slope angle between 42 and 45 degrees. All ore mined is crushed within the open pit by mobile crusher(s) and subsequently moved by truck from the open cut to a stockpile area adjacent to the processing plant. Waste material and overburden is stacked as permanent dump material in designated waste storage areas, the mined out south end of the open cut, or used in rehabilitation.

The Kara No. 1 open cut contains up to twenty-eight years of proven and probable reserves at a production rate of 350 000 tonnes of magnetite ore per year. Additional target resources have been indicated by previous exploration drilling programs immediately to the north of the current reserves and to the north of the Companion River. Tasmania Mines is in the process of preparing the Kara North open cut for production in mid to late 2011.

The company has a work force of sixteen full-time and two part-time employees, 14 to 18 contractors on a continuous basis in excavation, ore haulage and maintenance, and about ten further consultants and contractors in specialised roles as required.

Production

A total of 265 876 tonnes of magnetite ore with a nominal content of 50% Fe₃O₄ was mined and 305 426 tonnes of ore fed to the mill, with 136 465 tonnes of magnetite concentrate with a nominal content of 70% Fe₃O₄ being produced. A total of 9000 kilograms of scheelite concentrate was also produced from the ore treated.

A total of 1 554 446 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. The waste material was moved to the south end of the open cut for permanent storage. Waste was also used to rehabilitate the old coarse tailings dump, with smaller quantities used on roads and other rehabilitation projects around the site.

Reserves and Resources

Tasmania Mines currently operates mainly in the Kara No. 1 open cut, with limited activity in the Eastern Ridge open cut. The principal product mined is magnetite ore with scheelite extracted as a by-product. All original resource exploration/definition drilling was conducted at a time when the principal product was scheelite ore. The association between the magnetite and scheelite mineralisation enabled the definition of magnetite resources for operational purposes from existing drill core information for all reserves south of 6070N. To the north of 6070N the reserve has been estimated utilising a digital resource model prepared from assay information from a resource drilling program completed in 2008.

Reserves and resources were previously estimated (in the 1980s) for a number of ore bodies within the mining lease before the inception of the JORC code. The data for these areas are only used internally and are not published.

Kara No. 1 open cut

The ore reserve estimate for Kara No. 1 is drawn directly from the ore reserve report for December 2009; an updated ore reserve estimate will be produced in January 2011.

The Kara No. 1 ore body Reserves, by classification, at December 2009 comprised:

Location	Classification	Tonnes	Fe ₃ O ₄ (%)	JORC
North	Proven	2 159 139	43.5	Yes
North	Probable	5 276 317	41.4	Yes
South	Probable	2 393 727	42.0	No
North	Inferred	368 726	52.0	No
Total		10 197 900	42.4	No

(Note: South reserves are based on drill data from 1970 to 1984)

Subtraction of the 150 818 tonnes of production from January to June 2010 from the South probable reserve leaves a total mining inventory of 9 678 365 tonnes at 42% Fe₃O₄ (excluding Inferred Resources). At a production rate of 350 000 tonnes a year this equates to a reserve life (proven and probable) of up to 28 years as at June 2010.

Eastern Ridge

Scheelite resource and reserve estimates for Eastern Ridge were prepared before the inception of the current JORC

code and are now only used internally. Broken ore in the Eastern Ridge open cut is currently being stockpiled at Eastern Ridge until completion of a scheelite flotation stage at the process plant.

Kara North 266

Resource and reserve estimates for Kara North magnetite ore were prepared before the inception of the current JORC code and are now only used internally. AMC produced a JORC-compliant Inferred (Scheelite) Reserve for the Kara North 266 area of 456 000 tonnes at 0.78% WO₃ within a >0.2% WO₃ mineralisation shell. There is an additional 67 000 tonnes of 0.18% WO₃ estimated within this envelope but not included in the resource.

An open cut is under development to mine the scheelite and associated magnetite present at Kara North; approximately 356 000 tonnes at 0.75% WO₃ will be recovered from the planned open pit contained within a total magnetite mining inventory of 1.5 million tonnes and two million tonnes of waste rock.

Location 5

Resource estimates for Location 5 were prepared before the inception of the current JORC code and are only used internally. A revised JORC compliant resource estimate, based upon existing data, is planned during 2011.

Rehabilitation, environmental and pollution control initiatives

All rehabilitation, environment and pollution control objectives are achieved by adherence to the 2009 Environmental Management Plan which, together with the Mine Closure Plan, has been produced for Tasmania Mines by Pitt and Sherry. A specific objective has been the rehabilitation of old tailings and overburden dumps and

development of an in-pit waste (overburden) management strategy.

Major projects

Approval processes are ongoing for a new tailings dam with sufficient capacity to accommodate tailings storage from the known reserves. 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 plan has been approved and site preparation has commenced, with production expected to commence in mid 2011. The deposit is an extension of the Kara No. 1 ore body with similar mineralisation but a 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 Kara North and Kara No. 1 will be used to return the profile to its original state following mining.

Capital expenditure

Capital items purchased to June 2010 totalled \$1.325 million and were all associated with magnetite mill upgrades and improvements. Further capital spending on the new tailings dam, mobile crusher and a scheelite flotation plant will be forthcoming.

New developments

Completion of the proposed 2011 exploration program will permit complete life-of-mine planning to be carried out for the Kara No. 1 pit which will permit more effective production, access and waste management strategies to be developed.

Nickel

Minerals and Metals Group (MMG) Avebury mine

The Avebury mine, west of Zeehan, has been on care and maintenance since March 2009. A \$3 million review of the operation commenced in the March quarter, including an 8500 metre drilling campaign to establish more reserves.

Resources and Reserves

As at June 2010, Resources above 0.70% Ni cut-off grade comprised:

- Measured — 3.4 million tonnes @ 1.1% Ni;
- Indicated — 4.7 million tonnes @ 1.0% Ni;
- Inferred — 14.0 million tonnes @ 0.9% Ni;
- Total — 22.0 million tonnes @ 1.0% Ni.

Tin

Bluestone Mines Tasmania Pty Ltd Renison Bell and Mount Bischoff

Bluestone operates an underground tin mine at Renison Bell and an open-cut tin mine at Mount Bischoff.

Employment

At June 2010, 246 people worked in the operations, comprising 119 direct employees and 127 contractors. Of these 21 were employed at Mount Bischoff, with 87 employed in underground mining operations at Renison, 63 in processing operations and 53 in maintenance.

Production

A total of 391 940 tonnes of ore at an average grade of 1.73% tin was mined from the Renison Bell underground operation, with 198 436 tonnes at a grade of 1.30% tin being mined from the Mount Bischoff open pit.

A total of 587 414 tonnes of ore, comprising 390 415 tonnes from Renison Bell and 196 999 tonnes from Mount Bischoff, were milled yielding 6267.45 tonnes of tin in concentrate, all of which was exported.

A total of 30 954 cubic metres of waste was mined.

Rehabilitation, environment and pollution control

Renison

The Environmental Management Plan for the site was reviewed and approved in late 2009, and the Closure Plan for the site is currently under review. Significant progress has been made in the last year in terms of managing water quality on site, with a Suspended Solids Management Plan now in place. Control of pH in water discharged from the lease has also improved over the last year. Dewatering of the underground mine continues (the mine was allowed to flood when the previous owner went into administration in 2003) with the last of the floodwaters expected to be pumped out early in 2011.

Mt Bischoff

The Mt Bischoff operation went onto care and maintenance in July, although work is still ongoing on the waste rock dump caps. Because of wet weather, the final capping of the dumps is not expected to be completed until early 2011. The 2010 EMP review has been deferred, and will be carried out if mining recommences. Work is now focussing on the Closure Plan and Decommissioning and Rehabilitation Plan.

Water from the base of the Happy Valley dump is now being pumped to the disused pit for treatment, and the limestone drain (treating historic acid mine drainage only) has been relinquished. Biological monitoring showed that the aquatic health in the Waratah River continued to improve in 2010.

Reserves and Resources

Ore Reserves, as at 30 June 2010, comprised

Project	Cut-off (% Sn)	Tonnes (‘000)	Sn (%)	Tonnes (‘000)	Cu (%)
Proved Reserves					
Renison Bell	0.8	444	1.71		
Mt Bischoff	0.5	41	1.17		
Rentails	0.0				
Sub-total		485	1.66		
Probable Reserves					
Renison Bell	0.8	1 220	1.85		
Mt Bischoff	0.5	52	0.88		
Rentails	0.0	18 116	0.44	18 116	0.21
Sub-total		19 388	0.53	18 116	0.21
Total Mining Reserves					
Renison Bell	0.8	1 664	1.81		
Mt Bischoff	0.5	94	1.01		
Rentails	0.0	18 116	0.44	18 116	0.21
Total Reserves		19 873	0.56	18 116	0.21

Identified Mineral Resources as at 30 June 2009 comprised:

Project	Tonnes (‘000)	Sn (%)	Tonnes (‘000)	Cu (%)
Measured				
Renison Bell	1 023	2.12	544	0.18
Mt Bischoff	41	1.17		
Rentails	18 957	0.44	18 957	0.21
Sub-total	20 021	0.53	19 500	0.21
Indicated				
Renison Bell	3 183	1.68	331	0.19
Mt Bischoff	999	0.59		
Sub-total	4 182	1.42	331	0.19
Inferred				
Renison Bell	3 047	1.75	1 064	0.48
Mt Bischoff	699	0.47		
Sub-total	3 746	1.51	331	0.19
Totals				
Renison Bell	7 253	1.77	1 939	0.35
Mt Bischoff	1 740	0.56		
Rentails	18 957	0.44	18 957	0.21
Total Resources	27 948	0.79	20 896	0.22

Capital expenditure

Capital expenditure for the 2009/2010 year was \$1,715,940.

Tungsten

King Island Scheelite Limited Grassy

King Island Scheelite Limited continues to progress development plans for the scheelite resources at the former Dolphin and Bold Head mines on King Island.

Resources

Identified in situ mineral resources are:

- Dolphin (JORC compliant): indicated and inferred resources of 8.94 million tonnes at 0.92% WO₃ to 308 m below sea level, at a 0.25% WO₃ cut-off grade.
- Bold Head (JORC compliant): indicated and inferred resources 2.47 million tonnes at 0.76% WO₃, at a 0.25% WO₃ cut-off grade.

Current progress

From work undertaken during 2008/2009, the former open pit proposal was reassessed and a viable alternative

established. The revised plan removes risks associated with sea walls and potential ingress, and maintains acceptable returns through lower capital requirements and higher mill feed grades.

The current development plan involves underground mining of the remnant Dolphin deposit, delivering 300 000 tonnes per annum of high grade ore (1.30% WO₃) to an adjacent mill producing 3300 tonnes per annum of 65% WO₃ concentrate. An investment of approximately \$90 million would provide an initial six-year mine life before additional down-plunge tonnes of ore at Dolphin, or reopening the former Bold Head mine, are incorporated.

Subject to amending the existing development approvals to reflect the revised plan and confirming funding for the project, the company believes first production could follow within two years.

Industrial Minerals

Limestone and dolomite

Beams Brothers

Beams Brothers Pty Ltd operates quarries at Flowery Gully near Beaconsfield, and at Cressy. The company has twenty-two employees including office staff. Production for the reporting period totalled 53 115 tonnes of limestone and dolomite (metallurgical grade), 16 358 tonnes of lime and limestone (non-metallurgical grade), 81 980 tonnes of fine limestone and dolomite, 3166 tonnes of dolomite by-product, 9685 tonnes of limestone mixing stone, and 16 315 tonnes of ironstone. Extensive reserves of limestone, dolomite and ironstone remain.

At Flowery Gully, 15 000 m³ of overburden was removed to access the limestone resource. Rehabilitation works included a project to remove old tyres, and revegetation efforts continued in the southwest sector. A total of 8000 m³ of overburden was removed at Cressy. Rehabilitation works are progressing with tree and grass planting completed during the reporting period. An upgrade of the electrical installations on the crushing plants, PLC and parameter switches to make them fully automatic has been completed.

Cement Australia

Cement Australia Holdings Pty Ltd operates a limestone mine and cement plant at Railton. The majority of products were shipped to markets in Victoria and New South Wales via the Port of Devonport. The plant produces cement using the fuel-efficient pre-calciner manufacturing process and has its own limestone mine and operation. All production at the plant is controlled and closely monitored by a Gamma-Metrics cross belt X-ray analyser, together with a fully equipped laboratory.

Alternative fuels for the kiln system saw the commissioning of the SCL (spent cell liner) plant which burns the cell liner material from Rio Tinto Alcan at Bell Bay. Other smaller projects were commissioned during the year, notably the kiln shell cooling fans which dramatically reduced the cooling fan noise around the kiln system.

Rehabilitation of the old mine waste dumps continued during the reporting period with revegetation with native plants and disposal of asbestos underway. Work on the

Site Water Management Plan (SWMP) also continues. This plan addresses the issues surrounding management of groundwater and surface water from mining and cement manufacturing operations.

Circular Head Dolomite

Circular Head Dolomite & Trading Co. Pty Ltd operates a 120 hectare mining lease near Smithton. Production for the reporting period totalled 52 331 tonnes of screened product, 27 815 tonnes of powdered product and 7809 tonnes of ready-mix concrete. No further overburden was stripped to access the resource, and no rehabilitation works were completed in 2009/2010.

Sibelco

Sibelco Lime (Tasmania) Pty Ltd, formerly known as Unimin Lime (Tasmania) Pty Ltd, operates a limestone quarry and calcination plant at Mole Creek. Production for the 2009/2010 reporting period totalled 107 415 tonnes of stone, 44 130 tonnes of Ag-lime and 41 247 tonnes of other lime products. The operation employs twenty-nine staff including nineteen staff in the quarry and plant, two in maintenance, two in administration and six in management and sales.

Capital improvement projects included an upgrade to the eastern sediment ponds. An upgrade of the oil storage area will be undertaken once capital for the project is approved.

Environmental monitoring for stack emissions (kiln stack), dust, water quality and noise was carried out during the reporting period. Air quality and noise emissions complied with regulatory requirements and no complaints were received with regard to potential environmental nuisance. Permitted water quality discharge limits during high rainfall events at two discharge points exceeded regulatory limits for suspended solids and total iron.

Rehabilitation of the lower benches of the overburden dump was completed with the upper benches continuing. Sibelco plans to use a hydro-mulch seed application on the upper benches pending a stability assessment after recent heavy rains.

Fuel Minerals

■ Cornwall Coal Company NL

Operations

Underground

Production continued throughout the year using bord and pillar techniques. Underground production by Cornwall Coal from the Fingal Valley was from both the Duncan Colliery and Blackwood 4 Colliery.

The refurbished widehead continuous miner (CM06) with onboard bolting rigs was commissioned into the Blackwood Colliery in December 2009 after a major refurbishment to the cutter heads and bolting rigs and a new shovel.

Underground development of Blackwood 4 Colliery progressed to the north to access pillar extraction mining domains.

The Duncan colliery is nearing the end of its economic life but due to the delays in starting Blackwood 4 the mine will be going into areas of low yield to extend its life until the end of 2011.

Blackwood Colliery No. 3 entry

The rehabilitation has been monitored throughout the year with the rehabilitation progressing.

Huntsman No. 2 open cut

Exploration of the remaining reserves was carried out to determine the feasibility of recommencing mining and rehabilitating the previously mined area. It is planned to recommence mining in 2011.

Cullenswood open cut

Cullenswood produced coal 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 Duncan and blended to satisfy customer quality requirements.

A Mining Permit for the Cullenswood 2 open cut, situated to the west of the Cullenswood mine, was approved and initial earthworks for the mine commenced at the end of the reporting period.

Kimbolton Coal

The difficulties associated with the raw product from Kimbolton have precluded the use at any of our customer sites without the need for beneficiation of the raw coal at the Fingal washery. 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 back-load arrangement.

Production

Production of raw coal for 2009/2010 totalled 646 148 tonnes. This coal was sourced from the Duncan (374 912 tonnes), Cullenswood (92 773 tonnes), Blackwood 4 (60 091 tonnes) and Kimbolton (118 372 tonnes) mines.

Washery throughput of raw coal totalled 646 148 tonnes to produce 372 441 tonnes of saleable coal at a washery yield of 59.57%. Coal sales totalled 380 490 tonnes.

Approximately 252 749 tonnes of reject materials were deposited at the Duncan reject dump.

Exploration

Exploration for the remaining Huntsman 2 reserves was carried out during the reporting period. Exploration drilling to define the Cullenswood 2 reserves was carried out during the reporting period.

Capital expenditure

A total of \$1.5 million was spent on the development of the Blackwood 4 transport road portal and associated conveyor, ventilation fan, compressor and road works on the Blackwood site during the reporting period.

A further \$0.7 million was spent on the refurbishment of CM06 as well as the purchase of ancillary mining equipment including man transporters.

Rehabilitation

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

Employment

The company employed 101 people (including contractors) in the operation. This comprised 81 people employed in underground mining, processing and administration, with a further twelve contractors employed in coal transport and eight in open-cut operations.

Safety

One lost-time injury occurred during the period. An employee received an injury to his left hand and fingers whilst using a pedestal-mounted grinder with the wire brush attachment. He sustained a deep laceration down to the bone on the left middle finger, lacerations to the ring and little finger and a laceration to the palm below the thumb.

Cornwall Coal competed in the annual Tasmanian Mines Rescue Competition. Seven teams competed in the event.

Construction Materials

■ **BIS Industrial Logistics**

During the 2009/2010 reporting period, BIS Industrial Logistics operated sixteen mining leases at Launceston, Ridgley, East Devonport, Frankford and St Helens. The transfer of the leases held by Fieldwicks Pty Ltd to BIS was completed.

The Launceston BIS operation incorporates four quarries, which have been operational since the late 1970s, producing road construction and concrete aggregate materials. The Ridgley quarry, located approximately fifteen kilometres south of Burnie, has been operating since 1988. This operation produces crushed basalt quarry products.

Total production from all sites was 693 000 tonnes of materials, an increase of 33 000 tonnes from the previous reporting period. Crushed material was derived from 596 000 tonnes of basalt, 74 000 tonnes of quartzite and 23 000 tonnes of other sources such as quartzwacke and granite. A total of 20 000 m³ of overburden was removed to expose source rock for drilling and blasting at the two basalt operations.

BIS has 35 full-time employees and contractors including administration staff, operators, and subcontractors.

Ongoing progressive rehabilitation continued across all BIS sites, with major improvements in reducing airborne dust from fixed plant from changes to operational procedures and updated dust suppression equipment and practices.

BIS Industrial Logistics maintained tri-certification to AS9001, AS4801 and ISO14001 during the year. This certification incorporates compliance to Department of Infrastructure, Energy and Resources specifications and Australian Standards for pavement materials and aggregates, and Australian Standards for Occupational Health and Safety and Environmental compliance.

■ **Boral Resources (Tasmania) Limited**

Boral Quarries extracted material from two hard-rock quarries, at Bridgewater and Flowery Gully, over the reporting period. Boral employs twenty-five personnel in its Tasmanian operations.

Production for the year from the Bridgewater quarry totalled 464 400 tonnes of aggregates and road base products. The Tasmanian Government compulsorily acquired eleven hectares of land at the Bridgewater quarry for the construction of the Brighton Transport Hub and Boral was able to deliver strong road base volumes from the quarry for this development.

Production from the Flowery Gully site totalled 147 600 tonnes. Dust suppression measures at the quarry were upgraded to reduce the amount of dust being emitted to the atmosphere and onto the road. Boral also operates quarries at Nook and Launceston, although no production was reported for these quarries.

■ **Duggans Pty Ltd**

Duggans Pty Ltd operates six mining leases and pre-cast concrete production factories at Cradoc in the Huon Valley and at Launceston. Approximately 65 staff are employed across the company's operations. Production of raw materials totalled 128 000 tonnes, with raw materials processed downstream through the on-site readymix batch plant, the precast factory, or through the road works and earth moving departments.

Recycling of concrete waste has continued and Environmental Management Plans are in the process of being upgraded. A Quality System to ISO 9002 has been developed and implemented to ensure that all customer requirements are satisfied.

Duggans Pty Ltd has been involved with a number of major projects throughout Tasmania, including the RACT office complex in Hobart, Launceston General Hospital redevelopment and the Brighton Bypass.

■ **F R & C M Lazenby and Son**

The F R & C M Lazenby and Son sand extraction operation at South Arm employed the equivalent of four full-time and one part-time personnel during the 2009/2010 financial year. Production during this period was approximately 13 400 tonnes. Considerable reserves are estimated within the two mining leases.

■ **G L & D H Males Pty Ltd**

G L & D H Males operates a sand pit at South Arm and a retail operation in South Hobart. The company employs two full-time staff at the sand pit, and three full-time and five casual staff in transport and retail operations at South Hobart. Production from the South Arm mining lease totalled 47 834 tonnes of washed and horticultural sand, and 7320 tonnes of concrete and bedding sand. Future sources of dune sand will include re-working old areas.

Previously mined areas are currently being reworked for concrete and bedding sand. Mining will not progress into the proposed extension for a number of years. Coarse sand production has increased as the company has secured a new contract. Approximately 500 tonnes of fine silt has been reclaimed from the settlement dam and blended with imported loam and sand for resale.

Rehabilitation works at the South Arm lease are continuing in line with the site's Environmental Management Plan. The dunes on the southeastern side of the property have been re-contoured and seeded with *Acacia sophorae*, *Acacia floribunda* and *Myoporum insulare*. Transplanting to the foot of the dune also continued, together with seed collection and propagation.

■ **Gunns Forest Products P/L**

Gunns Forest Products Pty Ltd, and its subsidiaries Tasmanian Pulp and Forest Holdings Pty Ltd and Associated Forest Holdings Pty Ltd, manage and operate sixty-six

licensed quarries across Tasmania, providing road construction and maintenance materials for approximately 6000 kilometres of forest road.

Quarrying and road construction was performed by contractors under the supervision of company staff. Four full-time roading supervisors are employed to manage the quarrying works and contractors. All licensed quarries are subject to the provisions of a management plan which includes a requirement to progressively rehabilitate and restore mined-out sections of quarries, including ongoing remodelling of benches and housekeeping to clean sumps and drains.

Gunns Forest Products Pty Ltd has a certified Environmental Management System compliant with ISO 14001. In addition the company's forestry operations (including quarrying and road activities) and forest management system is certified compliant with the Australian Forestry Standard. All forestry activities, including quarrying and road works, are subject to annual independent third party audits.

■ Hanson Construction Materials

Hanson Construction Materials Pty Ltd has fifteen full-time and one part-time employee at its operations in Hobart (Flagstaff Gully), Calder and Potato Hill (George Town). During the 2009/2010 reporting period 190 000 tonnes of aggregates, 140 000 tonnes of road materials and 57 000 tonnes of sand were produced across the three operations.

The DPMP for an extension of the Flagstaff Gully quarry was submitted in December 2010, and the rezoning application has been approved by the Clarence City Council and ratified by the Tasmanian Planning Commission. 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.

Rehabilitation works have continued at all sites. At Flagstaff Gully, the overburden has been stripped and stockpiled for rehabilitation and contractors have been engaged to continue the eradication program for pampas grass. A weed eradication program has been in place at both Potato Hill and Calder during the reporting period. At Calder a rehabilitation plan was completed, with the southwest pits 1 and 2 being 80% complete and the west central pit 100% complete.

■ HBMI Pty Ltd

Hobart Blue Metal Industries (HBMI) operates a dolerite quarry at Leslie Vale, fourteen kilometres south of Hobart. The company has sixteen permanent employees in production, two with the mobile crushing equipment, and four weighbridge and support staff. A further forty people are employed as subcontractors for material deliveries, drill and blast activities, and maintenance as required.

During the reporting period 740 000 tonnes of rock was extracted, with 650 000 tonnes of road base, 80 000 tonnes of concrete aggregates and 10 000 tonnes of asphalt aggregate and landscape supplies being produced.

In June 2010 a permit was granted to operate an inert landfill and resource recovery centre for building, demolition and construction waste. An Environmental Management Plan has been completed for the quarry operation. Dust monitoring stations and a weather station were installed to assist with the control of dust during inclement weather.

■ Lloyds North

Lloyds North employs eight people at the Kimberleys Road and Riggs Road quarries near Ulverstone. Production from the Riggs Road quarry totalled 68 767 tonnes of basalt. The oversize rock reduction program continued in 2009/2010. Production at Kimberleys Road totalled 64 603 tonnes of concrete and sealing aggregate and 26 341 tonnes of road base material.

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.

■ Norske Skog Boyer

Norske Skog operates fourteen quarries, primarily to maintain State forest and private roads used for timber harvesting and transport to supply its Boyer paper mill. During the year the majority of quarrying and roading occurred in the Plenty Valley, Styx Valley, Tyenna and Ellendale areas.

Production for the year consisted of 38 000 tonnes of carted raw, crushed and screened material, with 25 000 tonnes of stockpiled material. The majority of material is won by dozer/excavator. Minimal drill/blast is expected in the future. Norske Skog outsource labour and machinery to a contractor who employs twenty people. One full-time Norske Skog employee supervises the contractors.

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. Reserves in the existing quarries are unknown but should be sufficient for the next decade of operations. Two quarries are currently being rehabilitated prior to surrender.

■ Sanbar Pty Ltd

During the 2009/2010 financial year Sanbar Pty Ltd employed four personnel at their sand extraction site at Llanherne. Production consisted of 98 553 tonnes of screened sand and 7079 tonnes of bedding sand. Rehabilitation of the initial two hectare working area is nearing completion with rehabilitation of the next two hectares to commence soon.

The total reserve has decreased due to the need to increase the floor area to avoid flooding. Negotiations are currently underway with the Clarence City Council regarding a road use levy. A weed management plan has

been implemented to manage the exotic weed Cut-leaf Nightshade, which has become apparent in disturbed areas.

■ **Stornoway Quarries Pty Ltd**

Stornoway operates quarries at Breadalbane, Merseylea, Marshall Creek and Glengarry. An application to increase production at Breadalbane to 200 000 m³ per annum was approved in the reporting period. Production at the Northdown pit, operated under the recently acquired subsidiary Industrial Sands and Silica, has finished and the lease will be surrendered. Stornoway also has an application to operate a 20 000 m³ quarry near Queenstown.

■ **Treloar Transport**

Treloar Transport Company operates the Shackley Hill quarry at Sheffield, employing five full-time staff and a contract driller and shot firer, and a smaller quarry at Claude Road. Production for the twelve-month period from both sites totalled 127 000 tonnes of material. Approval from the EPA has been given for a landfill facility in the worked out area of Shackley Hill.

The company has a Quality Management System accredited to ISO9001, and an Integrated Management System (quality, health and safety, environmental) that satisfies the Civil Contractors Federation System Management Code.

ANNUAL REPORT

Rehabilitation of Mining Lands Trust Fund

The major focus of activity during 2009/2010 was mine site safety, with twelve mine shafts and two adits being either capped or fitted with grating to provide for public safety. Locations of safety work included Warrentinna, Lefroy, Beaconsfield, Scamander, Zeehan and Gipps Creek.

Minor follow-up works were carried out on previous rehabilitation at several abandoned mine sites and quarries. The main land remediation projects for the year were preparation and planning for rehabilitation of historic tailings at Royal George, and rehabilitation of gravel pits at Sisters Hills. Funds were also allocated to native seed collection for future revegetation at Storys Creek.

A total of approximately \$91,367 was spent from the Rehabilitation of Abandoned Mining Lands Trust Fund during the 2009/2010 period.

Mine safety

- Grating was fitted to the Coronella main shaft at Warrentinna (\$11,870).
- Grating was fitted to the Orieco adit near Scamander (\$6,500).
- Two open shafts were capped with concrete panels at the historic Excelsior mine at Lefroy. A maintenance check and necessary repairs were also performed on shaft fences and signage previously installed under the Abandoned Mining Lands program. Investigations were carried out and engineering design produced as a preliminary to installing grating over the Volunteer main shaft. Expenditure totalled \$7,500.
- Six shafts at Beaconsfield were capped with concrete panels. Recently burnt areas of Dans Hill were surveyed

for hazards associated with abandoned mines. Expenditure totalled \$3,320.

- Two shafts were capped and an adit was fitted with grating at the historic Ben Lomond Company workings at Gipps Creek (\$6,520).
- A collapsed shaft off Dee Street at Zeehan was backfilled (\$750).
- Concrete panels were fabricated to maintain a ready stock for future shaft capping (\$18,000).

Mine site rehabilitation

- Sediment control measures on historic tailings at Royal George were investigated and documented. A further round of preparatory work for revegetation of tailings was also carried out, including application of lime and fertiliser, and weed management. Expenditure totalled \$15,942.
- Minor fertilising, weed control and native seed collection were carried out at Storys Creek (\$3,583).
- Fertiliser was applied to sections of the previously rehabilitated Argonaut field at St Helens (\$315).

Quarry rehabilitation

- Approximately five hectares of abandoned gravel pits in the Whites Road area at Sisters Hills underwent rehabilitation. This included weed control, earthworks, seeding and fertilising. Expenditure totalled \$15,491.
- Infill seeding and follow-up fertilising was carried out on previously rehabilitated gravel pits at Rocky Cape (\$1,576).

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