TASMANIA
DEVELOPMENT
AND RESOURCES

Tasmanian Geological Survey Record 1997/02

Vision for Mineral Sector Growth
— TASGEOL 2005 —

Enhancing Tasmania's Mineral Prospectivity and Land Management Capability

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VISION FOR MINERAL SECTOR GROWTH

EXECUTIVE SUMMARY

INTRODUCTION

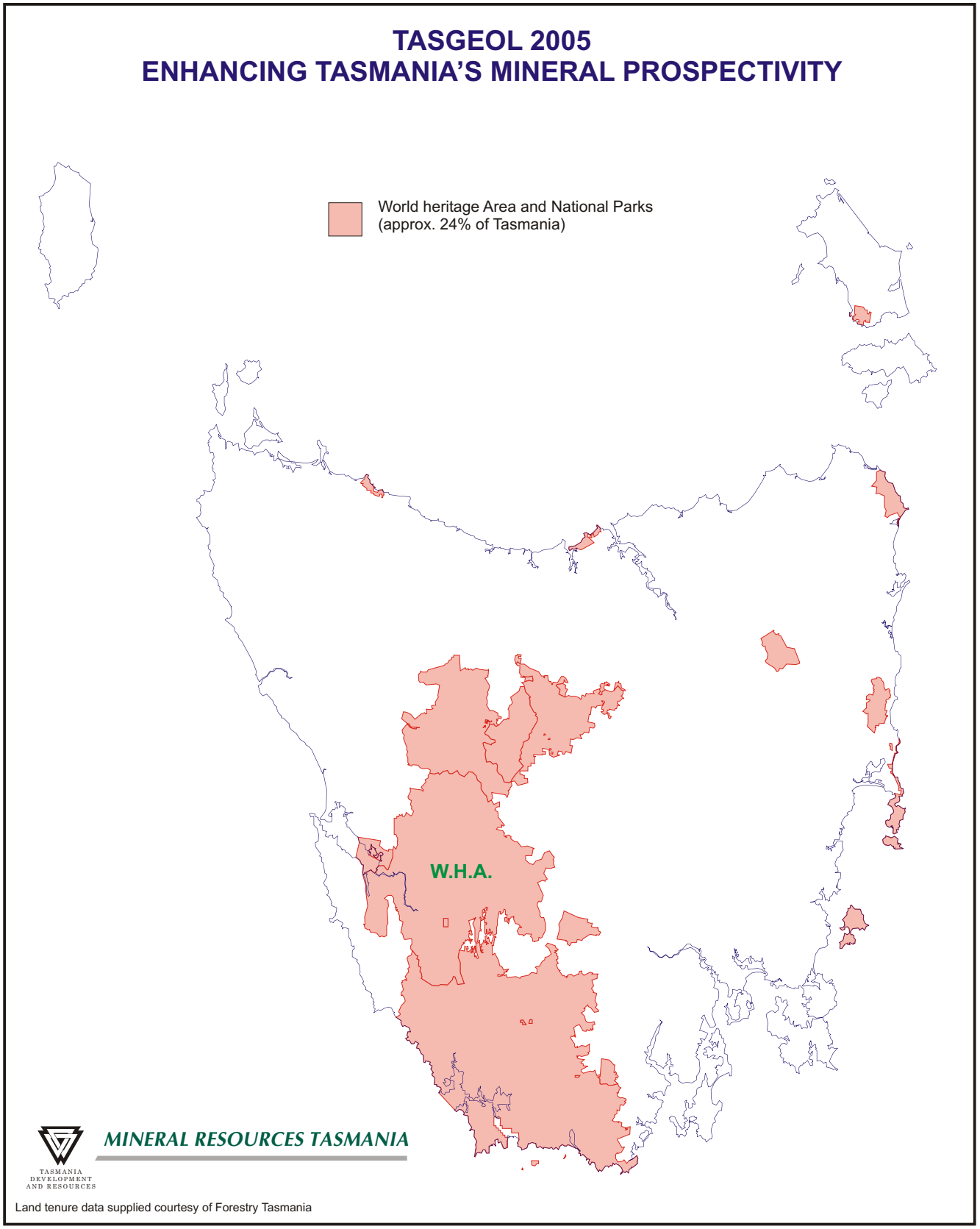
Tasmania contains a number of world-class mines within its various mineral provinces. Mining in Tasmania has been an integral and vital part of the State's economic development for well over a century. During 1995/96, exploration expenditure reached its highest level for ten years ($18.8 m). This success has been obtained, and can only be maintained, by a continuing Government focus on this vital sector of the economy.

Growth in mineral exploration activity is essential for future development of the mineral sector and for the economic well being of Tasmania. Mining and mineral processing accounts for over 40% of Tasmania's export capacity and, during 1995/96, paid over $18 million to Government in charges, taxes and royalties. This investment must be protected by facilitating the discovery of new ore deposits for the mines of the next century.

Approximately 24% of the area of the State is currently unavailable for mineral exploration due to reserves of World Heritage and National Park-type classification (fig. 1). As well as this, the majority of areas of known high prospectivity; for example the Mount Read volcanic belt – 'Dundas Trough', northeastern gold areas and the Arthur Lineament, are already covered by exploration licences (fig. 2).

To attract further increases in the areas under exploration, the State needs to be able to demonstrate that there are further areas of high mineral prospectivity in Tasmania. To do this the Government needs to obtain new geoscientific information with which to convince the exploration industry that the mineral prospectivity of specific areas of Tasmania is higher than is presently considered.

Such areas are, for example, the probable southern continuation of the gold-bearing sequence from northeast Tasmania; the possible southeastern extension of Mount Read-type rocks, under younger cover sequences in the Midlands and southeastern parts of the State; and the relatively unknown area to the northwest of the Arthur Lineament (fig. 3).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World heritage Area and National Parks
(approx. 24% of Tasmania)
W.H.A.
MINERAL RESOURCES TASMANIA
TASMANIA
DEVELOPMENT
AND RESOURCES
Land tenure data supplied courtesy of Forestry Tasmania

Figure 1

BACKGROUND

Australian exploration dollars are increasingly being directed offshore. Over the last three years (1993/94–1995/96) the portion spent overseas has risen from 28% to 45% (Mineral Council of Australia figures), and this trend is expected to continue.

To entice mineral exploration companies to explore on mainland Australia, various State Governments have committed some $113 million for projects to acquire new geoscientific data between 1993 and the year 2000. The new data are being released to exploration companies as soon as they become available.

This commitment to the provision of data at a pre-competitive level was recommended by the 1993 Richard's Report commissioned by the Federal Government. Conclusive evidence exists to demonstrate that significant increases in private sector exploration investment follow the release of new data from such Government programmes.

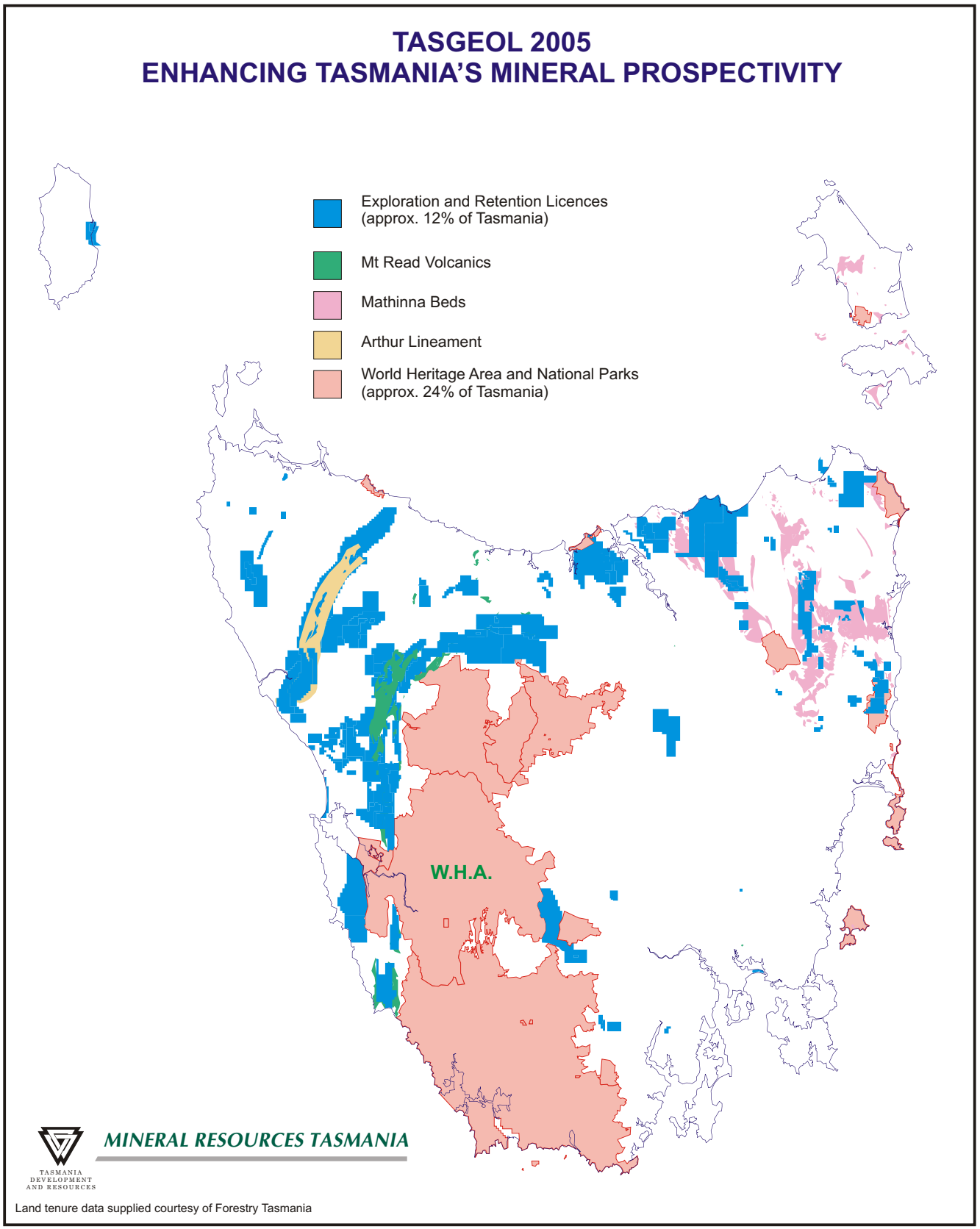
The interstate programmes include:

New South Wales	Discovery 2000	$40 million over 6 years from 1994
South Australia	Exploration Initiative	$22 million over 5 years from 1993
Victoria	Exploration Initiative	$16.5 million over 3 years from 1994
Queensland	GEOMAP 2005	$24 million over 6 years from 1994
Western Australia		$10 million over 4 years from 1994

In contrast, Tasmania's new initiative spending was $0.6 million, on the NETGOLD Project, during 1993/94.

Funding for new initiatives projects in Tasmania is urgently required to enable the State to not only keep, but also to increase, its current share of the Australian exploration budget.

If Tasmania is to maintain a competitive edge, new geoscientific information needs to be obtained, and data packages must be prepared and then aggressively marketed.


TASGEOL 2005
ENHANCING TASMANIA'S MINERAL PROSPECTIVITY
Exploration and Retention Licences
(approx. 12% of Tasmania)
Mt Read Volcanics
Mathinna Beds
Arthur Lineament
World Heritage Area and National Parks
(approx. 24% of Tasmania)
W.H.A.
MINERAL RESOURCES TASMANIA
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Land tenure data supplied courtesy of Forestry Tasmania

Figure 2

NEW PROJECTS

The Mineral Resources Tasmania (MRT) Division of Tasmania Development and Resources (TDR) has eight projects awaiting financing. Five of the projects, listed in order of priority below, originated from the Government's 1996 election policies on Mining and Mineral Processing. One initiative is from a Ministerial directive, and two have flowed from new Legislation.

Projects

1. Provision of integrated digital geoscience databases — Project TIGER (Tasmanian Information on Geoscience and Exploration Resources).
2. Evaluation of the prospectivity, and promotion of Tasmania's offshore oil and gas basins.
3. Undertake a Regional Minerals Programme (RMP) based on the Western Tasmanian Minerals Province.
4. Undertake the SOUTHGOLD, MIDMIN and NORWESTMIN geoscientific projects.
5. Provide continued funding for the Centre for Ore Deposit and Exploration Studies (CODES) at the University of Tasmania.
6. Assess the sources of sand available for building purposes in southern Tasmania.
7. Preparation of an inventory of acid drainage areas and sites, so that inappropriate development does not exacerbate the existing problems.
8. Develop geoscientific information databases for land management and local council planning schemes.

Projects 1 to 5 are from the Government's 1996 Election Policy statement on mining and mineral Processing.

Project 6 is due to a direction from the former Premier, the Hon. Ray Groom, MHA, when Minister for Mines. The longer that this project stays unfunded the greater will be the physical and political problems associated with the issue.

Project 7 is based on an objective contained in the draft State Policy on Water Quality Management.

Project 8 is due to the *Land Use Planning and Approvals Act*; the *Resource Management and Tribunal Act*; and a group of new Acts relating to local government (all 1993).

The level to which these programmes can be implemented depends on the level of funding received.

The Objectives of the Mineral Resources Tasmania (MRT) Division of TDR are to:

- Promote growth in exploration expenditure and investment by working with the exploration industry to obtain a 20% per annum increase in exploration expenditure, until sustainable levels are reached, ($30 million/year in real terms).
- Collect, maintain and distribute modern geoscientific data in such form as can readily be accessed and used for minerals and petroleum exploration and land management purposes (a community services responsibility).
- Increase acceptance by the community of the need for exploration and mining for community wealth generation, and to foster and encourage development of environmentally sensitive mining and effective rehabilitation techniques.

These projects are critical to the Government's ability to service the minerals and petroleum exploration industries and to deliver effective land and environmental management planning decisions.

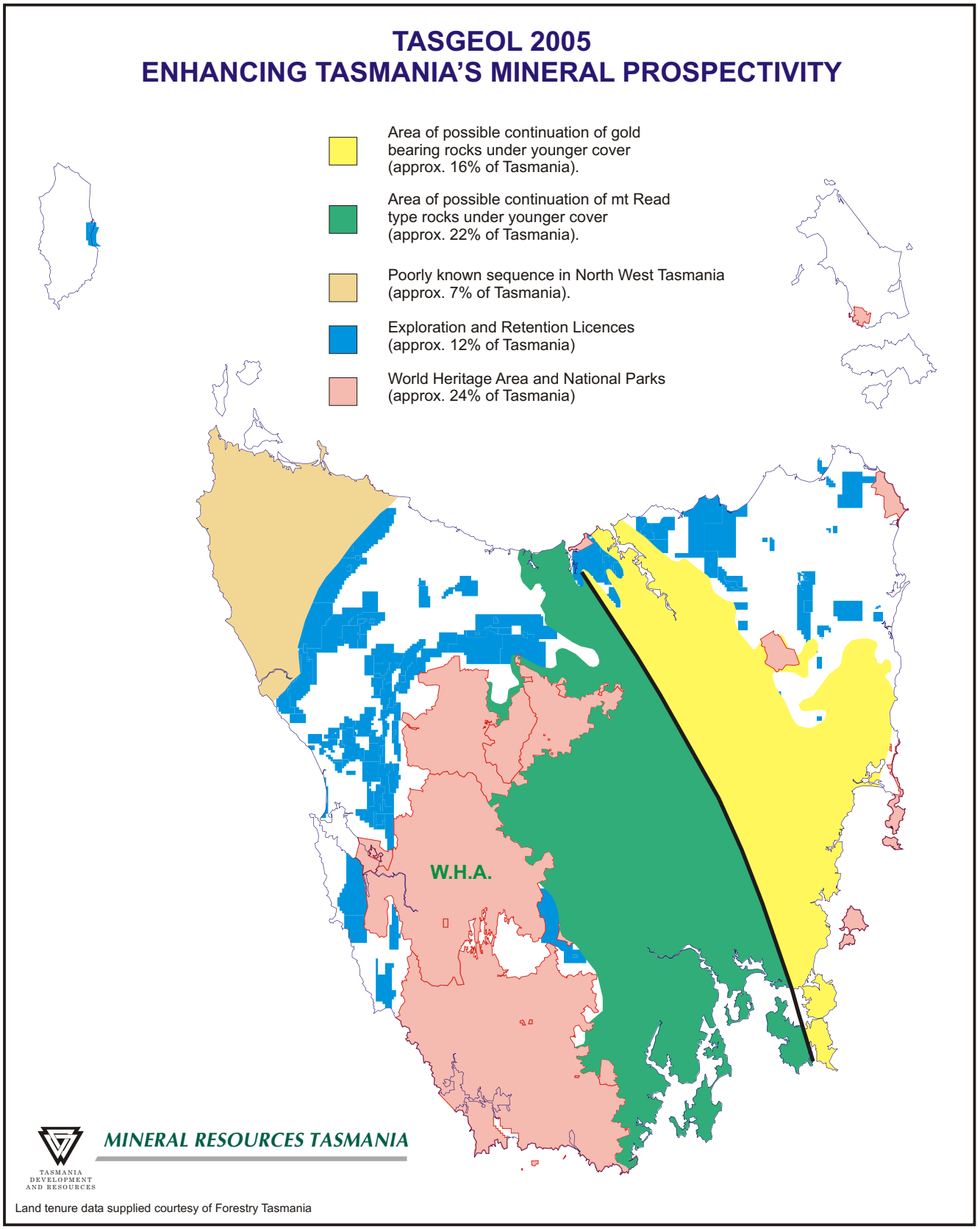
TASGEOL 2005
ENHANCING TASMANIA'S MINERAL PROSPECTIVITY
Area of possible continuation of gold bearing rocks under younger cover (approx. 16% of Tasmania).
Area of possible continuation of mt Read type rocks under younger cover (approx. 22% of Tasmania).
Poorly known sequence in North West Tasmania (approx. 7% of Tasmania).
Exploration and Retention Licences (approx. 12% of Tasmania)
World Heritage Area and National Parks (approx. 24% of Tasmania)
W.H.A.
MINERAL RESOURCES TASMANIA
TASMANIA DEVELOPMENT AND RESOURCES
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Figure 3

PROJECT SUMMARIES

The strategies proposed by Mineral Resources Tasmania are designed to protect and expand the present level of mineral exploration expenditure in Tasmania and to enhance land management decision making for the economic benefit of the State.

Project 1: Provision of Integrated Digital Geoscience Databases — Project TIGER

Project Title: Project TIGER (*Tasmanian Information on Geoscientific and Exploration Resources*)

This initiative will fund the integration then continued update and maintenance of all Mineral Resources Tasmania non-confidential geoscientific and tenement databases into a single, interactive system. The data will enable Government to provide up-to-date digital data to mineral exploration companies, all tiers of government, the private sector, and the community.

The objectives of this initiative are to:

1. Increase the level of economic activity in the mineral exploration and mining sectors.
2. Support effective land management decision making by ensuring that scientific information is more readily available to all tiers of government, the private sector and the community.
3. Secure the State's geoscience information asset, provide more efficient access to the information, and increase the value of the asset over time.
4. Market and distribute geoscientific information to a wider audience.

The first phase of this project, to computerise tenement management information, has been completed and a Business Case for Phase 2, which encompasses all the geoscientific databases, is currently being prepared.

When finished, Phase 1 and Phase 2 will be totally integrated.

Project 2: To evaluate the prospectivity of, and promote, Tasmanian offshore oil and gas basins

Project Title: Evaluation and promotion of Tasmanian offshore oil and gas basins

This initiative will provide an information package which will increase the probability of commercial oil and gas discoveries in Tasmanian offshore basins and so provide a range of benefits to the people of Tasmania.

The objectives of this project are to:

1. Produce a promotional package summarising the known geology and petroleum prospectivity of various offshore areas.
2. Promote the available offshore areas to potential explorers.

The results should be:

1. Increase the revenue to the State by increasing the area held for petroleum exploration offshore.
2. Eventually increase the standard of living of all Tasmanians by the finding of commercial oil and gas deposits offshore.

Project 3: Facilitate regional development in Tasmania by undertaking a co-operative Regional Minerals Programme (RMP) with the Commonwealth Government and industry

Project Title: Tasmanian Regional Minerals Programme

A Regional Minerals Programme (RMP) is a tripartite programme, between the Commonwealth, and State Governments and private industry. The purpose of the initiative is to improve investment potential and job opportunities in new and existing resource developments.

The development of the RMP would occur in two stages:

1. A review of existing infrastructure synergies for operating and planned resource developments in western Tasmania; and

2. Assessment of the level of geoscientific work required to provide data of a standard acceptable to industry for mineral exploration.

The aim of this initiative is to produce a regional development plan for the infrastructure needed for new mining and mineral processing projects, but which also improves the economic situation of currently operating projects, associated industry, and any other industries within the area of study.

The development of such a proposal would involve two stages:

1. A study of the infrastructure synergies necessary for resource development in remote areas; and

2. Assess the level of geoscientific data required to enhance the minerals prospectivity of the area under study.

The proposal will be based on the concept of a 'Western Tasmanian Mineral Province'. The present known extent of the province has two components, one onshore and one offshore.

The aims of a Tasmanian RMP (TRMP) would be to:

- make existing mining and mineral processing operations more cost effective;
- to lower the development cost of new projects; and
- to gather remote sensing data to facilitate mineral exploration.

It is anticipated that a TRMP would consist of:

- A regional study of existing projects, those that are about to come on stream, and those in the planning stage. It will look at the existing operations, identify common elements or future needs in infrastructure, such as water, roads, rail, power, gas, etc. not only for mining but also for on-site smelting and associated support industries.
- Obtain, with the aid of the Commonwealth Government's Australian Geological Survey Organisation (AGSO), modern remote-sensing data over areas where such data do not presently exist. TDR, through Mineral Resources Tasmania, would undertake geological field mapping to produce up-to-date, digital, geological maps of areas not presently covered to a standard acceptable to industry.

This would lead to:

- A regional development plan to identify the infrastructure needed to support an expanded industrial base in Tasmania; and
- A regional geoscientific database of the standard required to encourage and expedite mineral exploration.

This project would involve officers from both governments, industry, and external consultants. The process would take approximately two years and the cost to Tasmania would be around $300,000, with the Commonwealth Government and industry contributing similar amounts to the project.

Project 4: Undertake the SOUTHGOLD, MIDMIN and NORWESTMIN, Geoscientific Projects

Project Title: SOUTHGOLD, MIDMIN and NORWESTMIN Geoscientific Projects

These three projects will provide a coverage of modern geophysical, geological and geochemical data over major areas of Tasmania currently regarded as having low or unknown mineral prospectivity.

The project will entail the acquisition of aeromagnetic, radiometric and gravity data, and the drilling of strategically placed deep (~1000 m) drill holes. The results, when used in conjunction with geological data, will allow industry to examine Tasmanian geological structures in three dimensions.

This level of data coverage will allow explorers to assess prospectivity as part of their planning for exploration activities. These modern remote sensing methods can now be successfully used to map the geological structure of areas which are obscured by younger, non-mineralised, cover rocks.

The data collected will allow assessment of the prospectivity of the eastern and southeastern parts of Tasmania, which are covered by dolerite and flat-lying sedimentary rocks. These areas of the State have the potential to be underlain by mineralised rocks similar to those found in the highly mineralised western and northeastern parts of Tasmania. The areas have a further advantage in that they are unlikely to be compromised by acquiring National Park or similar land status.

To increase the area of Tasmania under exploration licence, the State needs to attract industry to areas which have not been explored by modern techniques. MRT proposes to develop up-to-date data packages over areas of the State where there is evidence of mineralisation, but where exploration activity is minimal. This increase in target area will prevent the stagnation in exploration expenditure experienced in the last decade.

Importantly, this initiative will create a competitive, increased and more effective mineral exploration investment climate in Tasmania. The project will provide excellent new data and act as a major incentive to minerals exploration groups to invest in Tasmania.

Project 5: Continue Government funding of the Centre for Ore Deposit and Exploration Studies (CODES) over the trimester 1997/98 to 1999/2000

Project Title: Government funding of CODES

The CODES Key Centre, through its research and teaching, makes a highly valuable contribution to Tasmania's mining and mineral exploration industries, and the new ideas and models generated may well provide the key to future discoveries and the continuation of the industry.

TDR has already committed $168,000 to CODES as the Government grant for 1996/97. This is slightly less than the amount of $180,000 requested by CODES.

An amount of $180,000 has been requested by CODES for 1997/98, followed by $200,000 for 1998/99 and $220,000 for 1999/2000. The funding is broken up into three areas:

- A general purpose cash grant;
- State Government Scholarship grant; and
- In-kind support.

The general purpose and scholarship grants are to be made payable annually, at the beginning of the financial year, according to the previous arrangement (i.e. on receipt of certificate signed by suitably qualified person to the effect that the previous grants were received and disbursed for the purpose for which they were given).

In-kind support is provided to CODES by MRT for for purchase of goods from Government agencies.

Project 6: To assess the sources of sand available for building purposes in southern Tasmania

Project Title: Sand resources of southern Tasmania

The building and construction industry is dependent on supplies of clay, sand, gravel and crushed metal for their continued operation. There is a need for long-term supplies to be identified, particularly around the main population centres.

Sand is used intensively for a number of purposes (e.g. concrete manufacture, bedding sand). A major portion of the sand requirements of the Hobart region is sourced from pits located on the South Arm Peninsula. Reserves in these pits, and other pits around Hobart, are declining and alternative sources need to be identified so that long-term resources are available. Although significant sand resources are known in the northern part of the State, transport adds significantly to the cost of providing sand which in turn would be passed on to the building and construction industry, and ultimately to the general public.

A study will be made of the sand resources available for extraction in southern Tasmania. This will involve compilation of existing relevant information, field examinations, and drilling so that resources at various locations can be more accurately quantified.

This initiative will provide vital information which will enable Government to make rational land use decisions so that a sand supply will continue to be available for the construction industry in southern Tasmania.

The project was directed to be undertaken by Premier Groom in 1996.

Project 7: To investigate acid drainage problems and prepare an inventory of affected sites and potential risk areas

Project Title: Acid Drainage Study

Acid drainage is an insidious problem affecting soils and waterways. There are two sources, with the most apparent being discharges from abandoned mines. The second is from naturally acid soils or pyritic rock close to surface, which can readily produce acid if disturbed by earthworks or clearing of vegetation.

The problem is highlighted in the State Water Quality Management Policy, and the Sustainable Development Advisory Council have recommended that MRT make surveys of both problem areas. Sites requiring remediation will be listed and areas which require appropriate development controls (i.e. limited earthworks, no clearing of flora, etc.) will be identified.

Project 8: Collation, on a Council area basis, of geological information to aid in the preparation of planning schemes

Project Title: Geoscientific information for land use planning

This project will provide up-to-date geoscientific information to land-use planners, particularly local Government, for the preparation of planning schemes so that issues concerning the mining industry, groundwater resources, foundation conditions (including landslide risk), and sources of construction materials and mineral fields are taken into account in the preparation of these schemes.

The State's development policy has been reformed by the introduction of new environmental and planning legislation including the *Local Government Act 1993*, which requires regular reviews of planning schemes. The preparation of comprehensive geoscientific information packages for planning schemes is a new function for the Department.

Provision of adequate geoscientific advice to councils for the preparation of planning schemes is growing into an important segment of Mineral Resources Tasmania's business. MRT has a function under the *Local Government Act (Section 36, Building and Miscellaneous Provisions) 1993* to declare landslide areas where considered appropriate. As well as landslide risk, information related to other foundation problems, such as expansive or reactive soil, soils with low bearing capacity and soils having erosion potential, should continue to be collected. MRT administers the *Groundwater Act 1985* and functions include guarding against groundwater pollution.

MRT provides information relating to the location of mineral fields and construction material sources (sand, gravel, clay) and the location of existing quarries and mines so that inappropriate zoning does not lead to inadvertent sterilisation of the State's mineral resources.

This project would:

- Ensure that areas with mineral deposits and construction materials are suitably zoned to allow for future extraction;
- Ensure that groundwater resources have adequate protection from land use activities that will cause pollution;
- Ensure that areas with known foundation problems, including the potential for landslide, are clearly indicated on planning schemes.

FUNDING

These eight distinct, but inter-related strategies, would provide Tasmania with geoscientific information as modern, interactive databases of a quality necessary to maintain the State's natural competitive advantage, as a world-class mineral provider, and as an effective land manager.

The following table clearly illustrates the level of annual funding suggested for the commitment to these strategies.

Funding	*1997/98*	*1998/99*	*1999/2000*	*2000/2001*	*2001/02*
Project 1	$300,000	$200,000	$200,000	$200,000	$200,000
Project 2	$100,000	$100,000	$100,000	Nil	Nil
Project 3	$300,000	Nil	Nil	Nil	Nil
Project 4	$1,050,000	$960,000	$980,000	$980,000	$980,000
Project 5	$180,000	$200,000	$220,000	Nil	Nil
Project 6	$100,000	Nil	Nil	Nil	Nil
Project 7	$70,000	$70,000	$70,000	Nil	Nil
Project 8	$75,000	$75,000	$75,000	$75,000	$75,000
Total Outlay	$2,1754,000	$1,595,000	$1,635,000	$1,245,000	$1,245,000

Against these costs, designed to provide not only for a sustainable mineral industry but also for community service needs, must be balanced the revenue Government enjoys from the Mineral Industry.

	1995/96 Actual ($'000)	*1996/97 Estimate ($'000)*
Royalties	6,267	7,750
Rents and Fees on Mineral Lands	783	770
Payroll Tax*	10,500	10,500
Other charges and taxes*	3,000	3,000
Total	20,550	22,020

* Estimated — based on actual figures for 1994/95

PROJECT 1:

Provision of integrated digital geoscience databases (Project TIGER — *Tasmanian Information on Geoscientific and Exploration Resources*)

Project Title: Project TIGER — Tasmanian Information on Geoscientific and Exploration Resources

Background

The aim of this project is the integration of all MRT's non-confidential, geoscientific and tenement databases into a single, interactive system. This will enable government to provide up-to-date digital data to mineral exploration companies, all tiers of government, the private sector, and the community.

The first phase of this project, to computerise tenement management information, has been completed and a Business Case for Phase 2, which encompasses all the geoscientific databases, is currently being prepared.

When finished, Phase 1 and Phase 2 will be totally integrated.

Description

This initiative will fund the integration of all Mineral Resources Tasmania's non-confidential geoscientific and tenement databases into a single, interactive system, to enable Government to provide up-to-data digital data to mineral exploration companies, all tiers of Government, the private sector, and the community.

The objectives of this initiative are to:

1. Increase the level of economic activity in the mineral exploration and mining sectors.
2. Support effective land management decision making by ensuring that scientific information is more readily available to all tiers of government, the private sector and the community.
3. Secure the State's geoscience information asset, provide more efficient access to the information, and increase the value of the asset over time.
4. Market and distribute geoscientific information to a wider audience.

Budget Output Link(s)

Tasmania Resources and Development Output 12 — Geoscientific data collection, storage and analysis, assessment, interpretation and publication.

Policy Objective

This initiative is part of the Liberal Government's 1996 Election Policy for mining and mineral processing.

The initiative originated with the Government's restructuring of the old Department of Mines into Mineral Resources Tasmania (MRT) in 1993 and the direction from Government that MRT was to proceed towards digital data management of geoscientific data, its storage, analysis, assessment, interpretation and publication/distribution of these data. This initiative will complete the development stages of the system and provide for its ongoing maintenance, upgrading and delivery of data to clients.

Production System

Phase 1 of this project, the Public Access Inquiry System (PAIS), which was to computerise tenement management information, was completed during 1994/95. A prototype of the user interface for the completed system has also been developed and is operational.

Phase 2, which encompasses all the geoscientific databases, is currently being scoped within a Business Case.

The TIGER system has been largely designed, produced, and developed by current MRT staff. However, some specific modules of the project need to be produced externally, as the expertise to undertake the production of these modules does not reside within the Agency.

Users

The Minister, TDR Executive, Mineral Resources Tasmania, State Audit, Treasury, exploration and mining industries, Forestry Tasmania, primary industries and building construction industries, DELM, SES, HEC, Works Tasmania, local government, research institutions, AGSO, libraries, general public.

Alternatives

The only known alternative to producing the system was to have out-sourced the production of the project to private industry. This alternative was not acceptable because of the cost of such a contract, and the fact that the majority of the project could be produced in-house with the aid of temporary input staff.

With increasing rates of data acquisition, and similarly increasing demands from clients for the data, the system is needed to fulfill our output requirements. The required gain in the efficiency of storage and retrieval of data can only be met by moving to digital methods.

Implications

A move to electronic storage and retrieval of geoscientific information is critical to maintaining the value of the asset.

To remain reliant on hard copy information:

(a) is inconsistent with the expectations of the users;

(b) restricts opportunities for value adding; and

(c) is dangerous with regard to maintaining the value of the asset.

Revenue

Direct and indirect income to Government generated by the mineral exploration and mining industries during exploration for, discovery and mining of new mineral and hydrocarbon deposits.

Duration

This initiative requires specific funding for one year to complete the building of the TIGER system, and ongoing funding for the three positions need to upgrade, maintain and output information.

A draft Business Case for this project, which will include the funding required, will be finalised by the end of February 1997.

PROJECT 2:

To evaluate the prospectivity of, and promote, Tasmanian offshore oil and gas basins.

Project Title: Evaluation and promotion of Tasmania offshore oil and gas basins

Description

This initiative will provide information which will increase the probability of commercial oil and gas discoveries in Tasmanian offshore basins and so provide a range of benefits to the people of Tasmania.

The objectives of this project are:

1. To produce a promotional package summarising the known geology and petroleum prospectivity of various offshore areas;
2. To promote the available offshore areas to potential explorers.

The results from the project should:

1. Increase the revenue to the State by increasing the area held for petroleum exploration offshore.
2. Eventually increase the standard of living of all Tasmanians by the finding of commercial oil and gas deposits offshore.

Output Links

Tasmania Development and Resources Output 12 — Geoscientific data collection, storage and analysis, assessment, interpretation, and publication.

Policy Objective

This project is part of the Liberal Government's 1996 Election Policy for mining and mineral processing.

Production System

The project will be undertaken as a collaborative project between Mineral Resources Tasmania and the National Centre for Petroleum Geology and Geophysics in South Australia. Reports will be produced to encourage industry to invest exploration capital in Tasmanian offshore areas.

Users

The Minister, TDR Executive, Mineral Resources Tasmania, Treasury, the petroleum exploration industry.

Alternatives

There are no alternatives to this project, which will entice exploration expenditure in the offshore areas.

Implications

Tasmania will miss out on vital offshore expenditure and development if this initiative is not adopted.

Revenue

The State currently receives rents of over $100,000/year from permits in the Bass Basin. With encouragement, industry could be persuaded to look at additional areas which are currently not held under permit. Revenue spent could be regained in rent alone.

Duration

This initiative requires funding for three years.

Year	*Total*	*Salary*	*Non Recurrent*
1997/1998	$100,000	$70,000	$30,000
1998/1999	$100,000	$70,000	$30,000
1999/2000	$120,000	$70,000	$50,000

PROJECT 3:

Facilitate regional development in Tasmania by undertaking a co-operative Regional Minerals Programme (RMP) with the Commonwealth Government and industry

Project Title: Tasmanian Regional Minerals Programme

Background

The Commonwealth Government, through the Office of Senator the Hon. Warwick Parer, Minister for Resources and Energy, has invited the Tasmanian Government, through the Office of the Hon. John Beswick, Minister for Mines, and the Premier as Minister for State Development, to participate with them and appropriate industries in a Regional Minerals Programme. The aim of the programme is for a co-ordinated regional approach to encourage the development of new mines, mineral processing and related infrastructure.

The project would involve officers from both governments, industry, and external consultants. The process would take approximately two years. The cost to Tasmania would be around $300,000, with the Commonwealth Government and industry contributing similar amounts to the project.

The proposal will be based on the concept of a 'Western Tasmanian Mineral Province'. The present known extent of the Province has two components, one onshore and one offshore.

The aims of a Tasmanian RMP would be to:

- make existing mining and mineral processing operations more cost effective;
- to lower the development cost of new projects; and
- to gather remote-sensing data to facilitate mineral exploration.

It is anticipated that a Tasmanian RMP would consist of:

- A regional study of existing projects, those that are about to come on stream, and those in the planning stage. It will look at the existing operations, identify common elements or future needs in infrastructure, such as water, roads, rail, power, gas, etc. not only for mining but also for on-site smelting and associated support industries.
- Obtain, with the aid of the Commonwealth Government's Australian Geological Survey Organisation (AGSO), modern remote-sensing data over areas where such data do not presently exist. TDR, through Mineral Resources Tasmania, would undertake geological field mapping to produce up-to-date digital geological maps of areas not presently covered to a standard acceptable to industry.

This would lead to:

- a regional development plan to identify the infrastructure needed to support an expanded industrial base in Tasmania; and
- a regional geoscientific database of the standard required to encourage and expedite mineral exploration.

Description

A Regional Minerals Programme (RMP) is a tripartite programme, between the Commonwealth, and State Governments and private industry.

The purpose of the initiative is to improve investment potential and job opportunities in new and existing resource developments.

The development of the RMP would occur in two stages:

1. A review of existing infrastructure synergies for operating and planned resource developments in western Tasmania; and
2. Assessment of the level of geoscientific work required to provide data of a standard acceptable to industry for mineral exploration.

Output Link(s)

Tasmania Development and Resources Output 1 — Project-based services providing specialist technical and professional advice, counselling, infrastructure development and financial assistance.

Tasmania Development and Resources Output 3 — Development of the business environment through infrastructure development, opportunity identification and policy advice to Government.

Tasmania Development and Resources Output 7 — Investment attraction to key industry sectors in Tasmania.

Tasmania Development and Resources Output 12 — Geoscientific data collection, storage and analysis, assessment, interpretation and publication.

Policy Objective

This project is part of the Liberal Government's 1996 Election Policy for mining and mineral processing.

Production System

The first phase of the RMP, that of investigating the infrastructure synergies for existing and planned resource developments, would be undertaken by an external consultant but with information provided by the State Government and private industry. The consultancy would be funded by the three parties.

The second phase, that of obtaining remote sensing geoscientific data to a standard acceptable to industry, would be funded by the Commonwealth Government.

Users

The Minister, exploration and mining industries, primary industries and building construction industries, State and Local Government agencies, research institutions, Commonwealth Government agencies.

Alternatives

The only known alternative for undertaking a RMP is for the State Government to fund the whole process. The alternative has been rejected because of the cost implications.

Implications

A RMP will allow Tasmania to produce a coherent strategic plan for resource development and infrastructure for the next 25 years. Such a plan will help lower the costs to existing mines and future project developments and provide better information for mineral and petroleum exploration.

If the initiative is not undertaken, *ad hoc* development and a lack of knowledge of infrastructure synergies will continue to cause higher cost structures for resource developments in western Tasmania.

Revenue

Direct and indirect income to Government generated by the mineral exploration and mining industries during exploration for, discovery and mining of new mineral deposits.

Duration

This initiative requires specific funding for one year to undertake the consultancy phase to study infrastructure synergies.

PROJECT 4:

Undertake the SOUTHGOLD, MIDMIN and NORWESTMIN geoscientific projects

Project Title: SOUTHGOLD, MIDMIN and NORWESTMIN geoscientific projects

Description

These projects will increase the area of Tasmania that is currently regarded as prospective and will provide a coverage of modern geophysical data over major areas of Tasmania currently regarded as having unknown mineral prospectivity. The project will entail the acquisition of aeromagnetic, radiometric and gravity data, and the drilling of strategically-placed deep (~1000 m) drill holes. The results, when used in conjunction with geological data, will allow industry to examine Tasmanian geological structures in three dimensions.

This initiative will allow explorers to assess prospectivity as part of their planning for exploration activities. These data will allow assessment of the prospectivity of southeastern Tasmania, an area of the State which has the potential to be underlain by mineralised rocks similar to those found in the highly mineralised western and northeastern parts of Tasmania.

To increase the area of Tasmania under exploration licence, the State needs to attract industry to areas which have not been explored by modern techniques. MRT propose to develop up-to-date data packages over areas of the State where there is evidence of mineralisation, but where exploration activity is minimal. This increase in target area will prevent the stagnation in exploration expenditure experienced in the last decade.

Importantly, this initiative will create a competitive, increased and more effective mineral exploration investment climate in Tasmania. The initiative will provide excellent new data and act as major incentive to mineral and petroleum exploration groups to invest in Tasmania.

Output Link(s)

Tasmania Development and Resources Output No. 12 — Geoscientific data collection, storage and analysis, assessment, interpretation and publication.

Policy Objective

This project is part of the Liberal Government's 1996 Election Policy for mining and mineral processing.

Production System

The projects included in this initiative will be managed by Mineral Resources Tasmania. Contractors will acquire most of the geophysical data and will undertake the stratigraphic drilling. Mineral Resources Tasmania staff will provide the geological backup, including field mapping, input of data collected into TIGER (the Tasmanian geoscience digital data storage and retrieval system), and complete data interpretation and presentation.

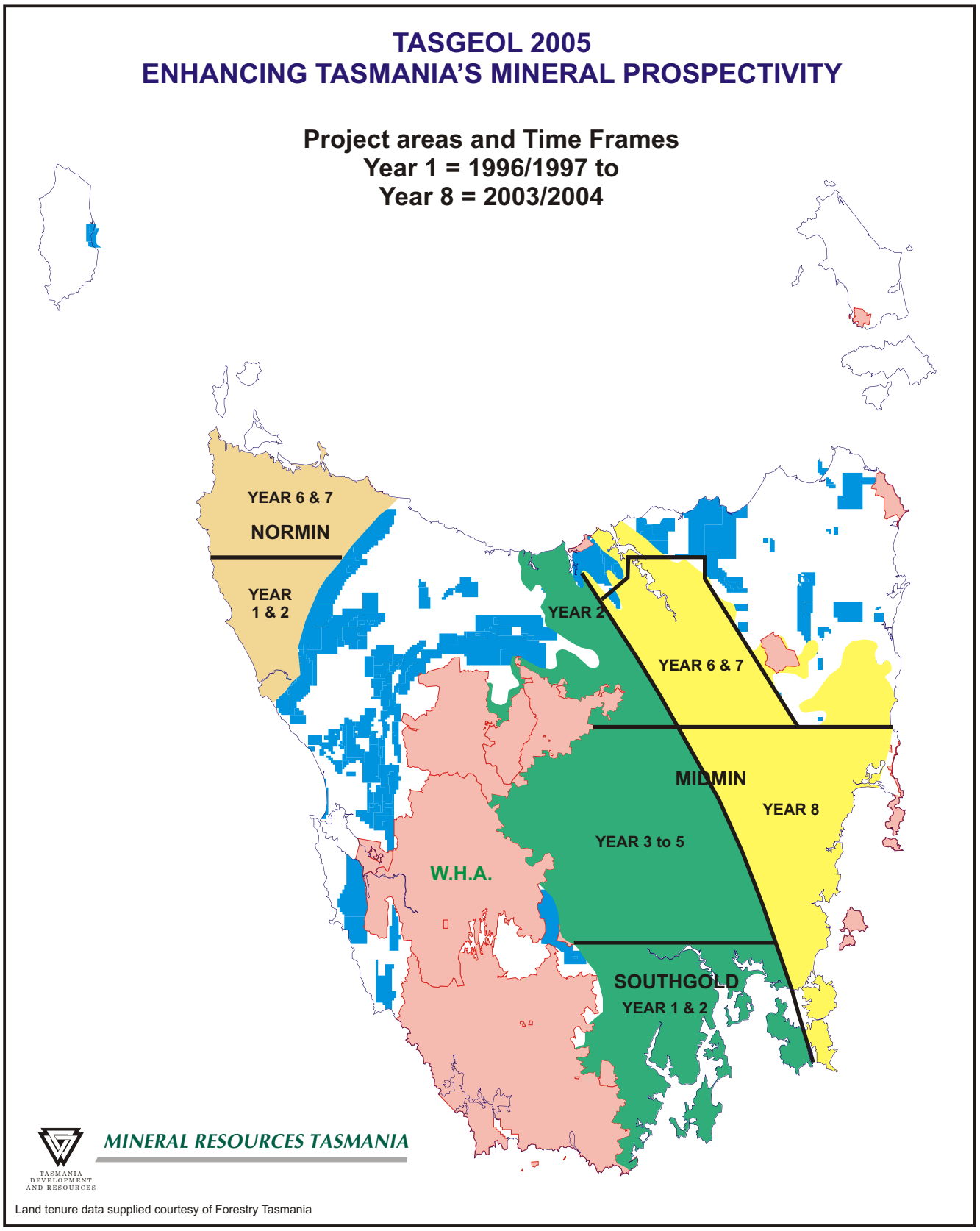
TASGEOL 2005
ENHANCING TASMANIA'S MINERAL PROSPECTIVITY
Project areas and Time Frames
Year 1 = 1996/1997 to
Year 8 = 2003/2004
YEAR 6 & 7
NORMIN
YEAR
1 & 2
YEAR 2
YEAR 6 & 7
MIDMIN
YEAR 8
YEAR 3 to 5
W.H.A.
SOUTHGOLD
YEAR 1 & 2
MINERAL RESOURCES TASMANIA
TASMANIA
DEVELOPMENT
AND RESOURCES
Land tenure data supplied courtesy of Forestry Tasmania

Figure 4

Users

Exploration and mining industries, Mineral Resources Tasmania, Forestry Tasmania, primary industries and building construction industries; DELM, Local Government, research institutions, AGSO, libraries, schools.

Alternatives

The alternative is not to collect new data over areas of unknown mineral potential. This option is rejected as it will result in Tasmania losing its share of the exploration expenditure and a reduction in the rate of new mineral discoveries, with a consequent reduction in royalties as producing mines close down.

MRT has had considerable success in 'repackaging' existing data in an effort to attract exploration to new areas, but its capacity to maintain this is limited by the available data.

The acquisition of new data, using the presently available funds, will not generate the data needed to attract the investment required to find new mineral and petroleum deposits.

Implications

Currently 45% of the Australian exploration expenditure goes overseas (1995/96 figures).

Other states have initiatives which enable them to compete for exploration expenditure:

New South Wales	Discovery 2000	$40 million over 6 years from 1994
South Australia	Exploration Initiative	$22 million over 5 years from 1993
Victoria	Initiative for Minerals and Petroleum	$16.5 million over 3 years from 1994
Queensland	GEOMAP 2005	$24 million over 3 years from 1994
Western Australia		$10 million over 4 years from 1994

By contrast, Tasmania has only spent $0.6 million on the NETGOLD Project during 1993/94.

Without a commitment from Government to continue the acquisition of geoscientific information, Tasmania's share of the mineral exploration industry will steadily diminish. As a result, income generated by the mining industry will diminish with time.

Revenue

Direct and indirect income generated by the exploration for, discovery and mining of new mineral deposits.

Duration

This initiative requires 3 years funding to complete the SOUTHGOLD and NORWESTMIN projects. Following this, the undertaking of the MIDMIN project would require a further 5 years funding (see Appendix 2).

Funding

The following funding is for the first three years which will cover the SOUTHGOLD and NORWESTMIN projects. Funding for the MIDMIN project is detailed in Appendix 2.

1997/1998	Aeromagnetics and radiometrics	$605,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	**$1,005,000**
1998/1999	Aeromagnetics and radiometrics	$460,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	**$960,000**
1999/2000	Aeromagnetics and radiometrics	$480,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	**$980,000**

PROJECT 5:

Continue Government funding of the Centre for Ore Deposit and Exploration Studies (CODES) over the trimester 1997/1998 to 1999/2000

Project Title: Government funding of CODES

Background

The State Government has been a major and vital funding sponsor for CODES since the Centre's inception in 1989. As Mineral Resources Tasmania does not undertake pure geoscientific research and relies on the work undertaken at CODES to assist it in obtaining our outcomes, it is recommended that a continuation of that funding occurs for the next trimester (1996/97 to 1998/99), at a slightly revised level.

The CODES Key Centre, through its research and teaching, makes a highly valuable contribution to Tasmania's mining and mineral exploration industries, and the new ideas and models generated may well provide the key to future discoveries and the continuation of the industry.

Although the Key Centre is to be amalgamated with the Geology Department over the next two years, the high profile work of CODES in economic geology, and its world-class research, will continue, and will continue to be important to the State's mining industry.

TDR has already committed $168,000 as the Government grant to CODES for 1996/97. This is slightly less than the amount requested by CODES, but is considered adequate.

An amount of $180,000 is requested by CODES for 1997/98, $200,000 for 1998/99, and $220,000 for 1999/2000. The breakup of this requested funding is:

	1997/1998	*1998/1999*	*1999/2000*
Cash — General purpose	$70,000	$80,000	$90,000
Scholarship	$60,000	$70,000	$80,000
In-kind	$50,000	$50,000	$50,000
Total	$180,000	$200,000	$220,000

The general purpose and scholarship grants are to be made payable annually, at the beginning of the financial year, according to the previous arrangement (i.e. on receipt of certificate signed by suitably qualified person to the effect that the previous grants were received and disbursed for the purpose for which they were given).

The In-kind amount is to be held by the Director, Mineral Resources, for payment of any costs incurred throughout the year.

Description

The Key Centre for Ore Deposit and Exploration Studies (CODES) was established, at the University of Tasmania, in 1989 with a Commonwealth grant and additional funding from the State Government and mining industry.

The Key Centre has established an international reputation for excellence in research and teaching in economic geology, with particular reference to Tasmanian mineral deposits. The work of the Key Centre is seen as a highly valuable contribution to the mining and exploration industries in Tasmania.

The State Government has been a major and vital funding sponsor for CODES since the Centre's inception in 1989. Mineral Resources Tasmania (MRT) does not undertake pure geoscientific research and relies on the work undertaken at CODES to assist it in obtaining its outcomes.

Output Link(s)

Tasmania Development and Resources Output 12 — Geoscientific data collection, storage and analysis, assessment, interpretation and publication.

The Government has a political commitment to the CODES Key Centre.

Policy Objective

This project is part of the Liberal Government's 1996 Election Policy for mining and mineral processing (see attached Liberal Policy Statement).

Production System

The State grant comprises three parts:

- General Purpose Grant;
- Tasmanian Government Mining Scholarships;
- In-kind Services Grant.

The General Purpose Grant is distributed between research staff, laboratory, and field costs.

The State Government Mining Scholarships are allocated to Honours, M.Sc. and Ph.D. students to work on projects in Tasmania of relevance to the mining industry. The projects are vetted by, and in some cases co-supervised by, MRT staff.

In-kind Services are mainly provided by MRT (e.g. x-ray diffraction services, geophysical equipment hire), but include purchases from other Government agencies, such as digital base maps from DELM and publications from the Government Printing Office.

Users

Mineral exploration and mining industries, Mineral Resources Tasmania, research institutions, AGSO.

Alternatives

An alternative would be to fund MRT to undertake such research, but this is not currently supported by Government Policy. The work undertaken by CODES is not currently done by any other organisation in the State.

Implications

None.

Revenue

Direct and indirect income generated by the exploration for, discovery of, and mining of new mineral deposits.

Duration

Three years for the financial years 1997/1998 to 1999/2000.

Funding

At the moment the project is funded from the ATI budget. The 1996/97 amount of $168,000 being a budget direction from the Government. It is understood that Treasury will review the grant during the 1997/98 budget process.

Future funding requested by CODES:

1997/1998	Cash — General Purpose	$65,000	
	Scholarship	$65,000	
	In-kind	$50,000	**$180,000**
1998/1999	Cash — General Purpose	$75,000	
	Scholarship	$75,000	
	In-kind	$50,000	**$200,000**
1999/2000	Cash — General Purpose	$85,000	
	Scholarship	$85,000	
	In-kind	$50,000	**$220,000**

PROJECT 6:

To assess the available sources of sand for building purposes in Southern Tasmania

Project Title: Sand resources in southern Tasmania

Description

This initiative will provide information which will enable Government to make rational land use decisions to enable the continued availability of a sand supply for the construction industry in southern Tasmania.

A study will be made of the sand resources available for extraction in southern Tasmania.

Outcomes

To ensure a supply of sand for the construction industry in southern Tasmania.

Output Links

Tasmania Development and Resources Output 12 — Geoscientific data collection, storage and analysis, assessment interpretation and publication

Policy Objective

This project was directed to be undertaken be Premier Groom in 1996. Funding was not provided by Treasury in the 1996/97 budget.

Production System

The project will result in production of a report and drilling information to be used by Government and industry.

Users

The Minister, TDR Executive, Mineral Resources Tasmania, Treasury, the construction materials and building industries, and the general public.

Alternatives

There are no alternatives to this study which will result in ensuring a long-term local supply of sand for the Hobart market.

Implications

If suitable sand resources cannot be found in southern Tasmania the community will face charges of $20/tonne for the transport of building sand form northern Tasmania. This will amount to $2 to $3 million annually in transport charges.

Revenue

The community will be saved considerable sums in transport expenses if a local sand supply can be delineated.

Duration

This initiative requires funding of $100,000 for the 1997/1998 year.

PROJECT 7:

To investigate acid drainage problems and prepare an inventory of affected sites and potential risks

Project Title: Acid Drainage Study

Description

Acid drainage is an insidious problem affecting soils and waterways. There are two sources, with the most apparent being discharges from abandoned mines. However, naturally acid soils or pyritic rock close to surface can readily produce acid if disturbed by earthworks or clearing of vegetation.

Outcomes

To produce an inventory of sites requiring remediation and areas which require appropriate development controls.

Output Links

Tasmania Development and Resources Output 12 — Geoscientific data collection, storage and analysis, assessment interpretation and publication.

Policy Objective

Objective contained in the draft State Policy on Water Quality Management.

Production System

The project will result in an inventory of sites producing acid drainage and identify areas requiring development controls.

Users

The Minister, TDR Executive, Mineral Resources Tasmania, Department of Environment and Land Management, Forestry Tasmania, Division of Land and Water Resources, HEC, the mining industry, local councils, developers and the general public.

Alternatives

There are no alternatives to this study, which will provide planning information related to acid drainage.

Implications

There is already a legacy of polluting leachates emanating from mineralised areas and regions of acid soil. Inappropriate development will exacerbate these existing problems and create new additional hazards.

Revenue

The funds spent on this project will result in a cleaner environment for all Tasmanians with subsequent savings in the long term in terms of health and water quality.

Duration

This initiative requires funding for two years.

1997/98	$70,000
1998/99	$70,000

PROJECT 8:

Geoscientific information for land use planning

Project Title: Geoscientific information for land use planning

Background

Fund a 'Land Use Planning Initiative', at a one-off project cost of $165,000, over two years and then an ongoing cost of $65,000, for one new staff member, to enable municipal councils to be provided with accurate data to be used in the review and development of their planning schemes and to enhance the work currently undertaken by the Engineering Geology and Groundwater Section.

In drawing up Municipal Plans, industrial, mineral resources and community service issues must be covered. These include:

- landslides;
- construction materials;
- quarry sites;
- groundwater reserves and use;
- mineral fields.

Provision of adequate geoscientific advice to councils for the preparation of planning schemes is growing into an important segment of Mineral Resources Tasmania's business. The State's development policy has been reformed by the introduction of the environmental and planning package of legislation including the new *Local Government Act*. The latter requires regular review of planning schemes by councils.

During 1995, planning schemes were intensively reviewed because of the above and because of planning consolidation following council amalgamation. As MRT did not have prior knowledge of the impact of the reviews on our work load, no budget or manpower planning were made.

It is estimated that a suitably qualified person will be required for 18 months to two years at a budget of $165,000 to complete this project, with the person then becoming part of the permanent Engineering Geology/Groundwater section to continue working on land management data associated with local government and to help with the expanding role of this Section (Appendix 4).

The Department has a function under the *Local Government Act (Section 36, Building and Miscellaneous Provisions) 1993* to declare landslide areas where considered appropriate. As well as landslide risk, information related to other foundation problems, such as expansive or reactive soil, soils with low bearing capacity, and soils having erosion potential, should continue to be collected.

The Department administers the *Groundwater Act (1985)*, and the collection of groundwater information and its collation is a continuing activity. Groundwater quality throughout much of the State is good and groundwater can be used for a range of purposes. There is a need to ensure that the water quality is maintained as near as possible to the present quality and that groundwater is not contaminated by inappropriate land use.

Monitoring of groundwater needs to continue, particularly with respect to use, variation of water tables and changes in quality.

The construction industry is dependent on supplies of clay, sand, gravel and crushed metal for its continued operation. There is a need for long-term supplies to be identified, particularly around the main population centres.

Description

This project will provide up-to-date geoscientific information to land use planners, particularly local Government, for the preparation of planning schemes so that issues concerning the mining industry, groundwater resources, foundation conditions (including landslide risk), and construction materials are taken into account in the preparation of these schemes.

The State's development policy has been reformed by the introduction of new environmental and planning legislation, including the *Local Government Act 1993* which requires regular reviews of planning schemes. The preparation of comprehensive geoscientific information packages for planning schemes is a new function for the Department.

Outcomes

- Ensure that areas with mineral deposits and construction materials are suitably zoned to allow for future extraction.
- Ensure that groundwater resources have adequate protection from land use activities that may cause pollution.
- Ensure that areas with known foundation problems, including the potential for landslide, are clearly indicated on planning schemes.

Output Link(s)

Tasmania Development and Resources Output 12 — Geoscientific data collection, storage and analysis, assessment, interpretation and publication.

Policy Objective

Legislation requires regular reviews of Local Government planning schemes and this provides an important opportunity to input geoscientific information into the process.

TDR has a function under the *Local Government Act 1993* to declare landslide areas where appropriate. Large tracts of land throughout Tasmania are subject to landslide.

TDR administers the *Groundwater Act 1985*, and the groundwater resource needs to be protected against contamination and sterilisation of potential supplies.

Production System

The supply of relevant geoscientific data to local Government (and other land use planners) will result in the following outputs:

- Geological maps from which geological issues specific to the needs of planners and land managers can be extracted.
- The identification of areas on existing planning schemes with inappropriate zoning as far as resource use is concerned.
- Outline of areas that produce or have potential to produce minerals and construction materials.
- Information on land stability, foundation conditions and groundwater in a form readily accessible to planners.

Users

Local government, planners and land managers, consultant engineers, Mineral Resources Tasmania, Department of Environment & Land Management, Department of Primary Industry and Fisheries, Forestry Tasmania.

Alternatives

TDR has a large body of information on geology, mineral resources and construction materials. As a result of the Department's functions in administering the *Groundwater Act 1985*, and declaration of landslide areas where appropriate under the *Local Government Act 1993*, it has accumulated a large store of information. Much of this information is widely dispersed and not in a readily useable form.

An alternative to this initiative is for Local Government and other land use planners to assemble the information. For each council to undertake the work separately, rather than having a dedicated person, would be cumbersome. In addition, some of the information is on sensitive or restricted files and maps.

Implications

It is essential that geoscientific data on resources and foundation conditions are considered in making land use decisions. Resources have been locked up by previous decisions and the potential for sterilisation will continue if relevant information is not supplied.

Groundwater resources, at a time when use is increasing, will be more subject to contamination if resource location and vulnerability to pollution are not considered.

Damage to homes and other structures as a result of landslide and other foundation problems will continue to occur, probably at more regular intervals.

Revenue

Direct and indirect income as a result of reserving areas for future extraction of resources.

Duration

Initially two years set up and then one FTE on a continuing basis to allow for on-going maintenance, upgrading and provision of data to clients.

APPENDIX 1
Detailed background for Project 3

Proposed Western Tasmania Minerals Province study under the Regional Minerals Programme (RMP)

Under the auspices of the Australian and New Zealand Minerals and Energy Council (ANZMEC), a Regional Minerals Programme (RMP) has been developed to facilitate regional development.

The programme was created following the success of the Carpentaria–Mt Isa Minerals Province Study (Northern Australia), which has been used to facilitate regional development in that area. The study enabled a coordinated, tripartite approach to the provision of infrastructure necessary for the development of this region.

The Carpentaria–Mt Isa study is now seen as a model for facilitating development in other regions where major projects are being undertaken.

A similar initiative is planned for the Central Goldfields area surrounding the southern portion of the Goldfields gas pipeline in Western Australia. This initiative is being investigated by the Commonwealth and Western Australian Governments.

On 4 August 1995, at ANZMEC 28 in Perth WA, the Hon. David Beddall, while speaking to Agenda Item 8 — *Mineral Province Enhancement Programme, Agenda*, extended an invitation to *"...take such an approach in Tasmania, Broken Hill and other areas."*

Following ANZMEC 28, States other than WA and Queensland have been requested to follow-up on the Commonwealth's invitation by proposing suitable projects for funding under this programme.

Project Proposal

It is proposed that Tasmania, through Minister for Mines and the Premier as Minister for State Development, accepts the Commonwealth's offer and that Mineral Resources Tasmania, on behalf of Tasmania Development and Resources, develop the project.

This proposal will be based on the concept of a 'Tasmanian Mineral Province'. The present, known extent of the Province has two components — onshore and offshore:

- The onshore area covers all known mineralised parts of western, northern and northeastern Tasmania. Southern extensions of the onshore areas are found around Glenorchy, Cygnet and near the Weld River. The presence of these extensions indicates that the mineral province may extend under the younger cover of central and southeastern Tasmania.

- The offshore component includes the southern extension of the Otway Basin west of King Island, the Sorell Basin off the west coast of Tasmania, and the Bass Basin, which covers most of Bass Strait. This component also includes the largely unexplored areas of the Eastern and South Tasman Rise.

The aims of a Tasmanian RMP would be to:

- make existing mining and mineral processing operations more cost effective;

- to lower the development cost of new projects; and

- to gather remote sensing data to facilitate mineral exploration.

The development of a proposal for a Tasmanian RMP would involve two stages. The first stage would be a study of the infrastructure synergies necessary for resource development in remote areas. The second stage would be to assess the level of geoscientific work required to provide data of a standard acceptable to industry for mineral exploration.

It is anticipated that the two phases of a Tasmanian RMP would consist of:

Phase one

- A regional study of projects which are already operating, those that are about to come on stream, and those in the planning stage. This will look at the existing operations, identify common elements or future needs in infrastructure, such as water, roads, rail, power, gas, etc., not only for mining but also for on-site smelting and a diversity of development not currently possible;

- A regional study of existing, planned and potential industry projects. This would include identifying common elements of present and future infrastructure needs of mining and mineral-related operations, such as water, road, rail, power and gas supplies. The study would include consideration of the diverse developments not yet possible because of a lack of co-existing infrastructure.

The result of this phase would be a regional development plan to facilitate the provision of better infrastructure for existing and future projects.

Phase two

- Obtain, with the aid of the Commonwealth Government's Australian Geological Survey Organisation (AGSO), modern remote-sensing data over areas where such data do not presently exist. TDR, through Mineral Resources Tasmania, would undertake geological field mapping to produce up-to-date, digital, geological maps of areas not presently covered to a standard acceptable to industry.

The results of this phase would be a regional geoscientific database of the standard required to encourage and expedite mineral exploration.

Phase 1 — Mining and mineral processing component of the project

The North West region of Tasmania is very rich in mineral deposits, and there is a high probability that further substantial mineral resources will be discovered as a result of the ongoing exploration in the area. A review of the operating and potential mining and mineral processing projects reveals the importance of the area to the State, and hence the need to improve the infrastructure in the area.

This review will identify currently operating and potential mining and mineral processing projects and indicate the infrastructure required for such projects to be undertaken or expanded.

Current Mining Operations

Hellyer mine

Aberfoyle Limited's Hellyer mine, situated some 65 km south of Burnie, is a major base metal mine which has an annual production of about 250 000 tonnes of zinc and 60 000 tonnes of lead in concentrates from 1.3 million tonnes of ore mined. The zinc concentrate is fed to the Pasminco Metals–EZ plant at Risdon near Hobart, while the lead concentrate is exported. The mine reserves are expected to be exhausted early next century. New discoveries are needed to extend the useful life of this modern processing plant.

Rosebery mine

Pasminco Mining's Rosebery mine, situated 90 km south of Burnie, is also a major base metal mine. Annual production is about 114 000 tonnes of zinc and 20 000 tonnes of lead in concentrates, plus 250 kg of gold in doré. The zinc concentrate is processed at Pasminco Metals–EZ, while the lead concentrate is exported. A $40 million underground exploration programme is in progress to confirm identified extensions of the ore bodies at depth.

Renison Tin mine

The Renison Tin mine, situated 15 km southwest of Rosebery, is owned by Renison Goldfields Ltd. It is one of the world's largest underground tin mines, producing 8300 tonnes of tin metal in concentrates per year, all of which is exported. An ore hoisting shaft for the Rendeep ore bodies was commissioned in July 1996.

Mount Lyell mine

The Mount Lyell mine, located 120 km south of Burnie in Queenstown, is a large copper mine. Until recently it was owned by Renison Goldfields Consolidated, who closed the mine at the end of 1994. The leases have been taken over by Gold Mines of Australia Ltd, with the mine reopening in December 1995. $60 million has been spent on the Phase 1 redevelopment to allow an annual production rate of 2.5 million tonnes of copper ore.

The company is currently completing a feasibility study to increase production to 3.5 million tonnes per annum (mtpa). Approval of this project, which will cost between $20 and $30 million, is expected by mid 1997. Investigations are continuing into the on-site production of copper metal, with the company confident that on-site production will have commenced by the year 2000.

Henty gold mine

The Henty Gold mine, owned by Goldfields Tasmania Ltd, is located in the Henty Valley, north of Queenstown. The mine was officially opened in July 1996. The deposit is estimated to contain 500 000 tonnes of ore with a grade of 27 g/t gold.

Savage River Mines

Until recently Savage River Mines, owned by Pickands Mather Ltd, operated an open-cut magnetite mine located 75 km southwest of Burnie, and a pelletising plant at Port Latta, where the magnetite is pelletised and partly reduced before export across a dedicated loading wharf. Pellet production was 1.6 million tonnes per annum, but the plant has a capacity of 2.5 mtpa. The mine ceased operating in early 1996 and the treatment of stockpiled ore had ceased by the end of 1996. Final shipment of iron ore concentrates and pellets are expected to be made before June 1997.

A agreement has been signed between the Tasmanian Government and Goldamere Pty Ltd (trading as Australian Bulk Minerals) for the redevelopment of the mine. A production rate of 2.5 mtpa of concentrate is envisaged. The feasibility study by Goldamere indicates a potential mine life of 25 years by deepening of the existing open cut with potential for subsequent underground mining. ABM are also seriously considering downstream processing of the concentrate to either HBI (Hot Briquetted Iron) or pig iron.

Kara mine

The Kara Mine, operated by Tasmania Mines Ltd, is an open pit scheelite-magnetite mine, located 25 km south of Burnie. The principal product is magnetite for heavy mineral separation and for blast furnace feed.

Corinna mine

The Corinna mine is a small open-cut silica mine located south of Savage River. A high-grade silica flour is produced in a beneficiation plant located near Burnie.

Circular Head Dolomite

A quarry is operated near Smithton to produce about 90 000 tpa of dolomite for agricultural and metallurgical use.

Mole Creek Limestone

A quarry operated at Mole Creek produces about 70 000 tpa of high quality limestone. Some 20 000 t of this is high-grade material for use in the Pasminco Metals–EZ zinc refinery in Hobart. High grade agricultural lime products are also produced.

Future Mining Projects

The Tasmanian West/North West Mineral Province is a highly prospective area with a wide range of geological environments. The area is certain to produce further mineral discoveries and mines beyond those already operating. Among the potential developments are the following:

Gold

The recent opening of the Henty gold mine, the re-opening of the Tasmania mine at Beaconsfield, and the NETGOLD project, have highlighted Tasmania's potential as a high-grade gold producer.

Copper

There are a number of active exploration prospects in the area, with a substantial likelihood of success.

Magnetite

Savage Resources Ltd holds a licence over a substantial reserve of magnetite at Long Plains, close to the Savage River Mines open pit. Future development of this deposit is highly probable.

Lead and Zinc

As with copper, there is considerable exploration for lead and zinc, with the aim of finding new deposits and extending the existing mine reserves. Pasminco Mining is undertaking a $40 million underground exploration project at their Rosebery mine, and Aberfoyle Ltd is seeking a new deposit to extend the life of the Hellyer mine. Exploration is also being undertaken to find lead-zinc deposits in limestone, similar to deposits in Ireland.

Natural iron-based pigments

Savage Resources Ltd holds a mining lease, over a deposit of umber, close to the Savage River mine. It is proposed that this deposit should be developed and the umber upgraded to a natural pigment. Magnetite can be similarly upgraded, and these two materials have the potential to become the basis for a pigment industry in Tasmania.

Magnesite

The area contains significant deposits of magnesite that could potentially be developed into a calcined magnesia project. Eventually these huge resources, principally held by CRA Ltd under Retention Licences, could be the basis of a magnesium metal based sector for Tasmania.

Mineral Processing Plants

There is a wide range of mineral processing plants in the area, and these have tended to push the available infrastructure, particularly electric power, close to the limit. More developments are possible with better infrastructure, especially the development of the Yolla natural gas field in Bass Strait.

The following mineral processing plants are currently operating in the area under consideration:

Port Latta pelletising plant

Australian Bulk Minerals intend to refurbish the facility at Port Latta and will use this plant to produce 2.5 mtpa of hematite pellets from magnetite ore.

Goliath Portland Cement Company Ltd

Goliath Cement operates a modern low-cost cement plant at Railton near Devonport. Following a recent expansion project, the plant now has an annual production capacity of one million tonnes of cement. A one million tpa limestone mine is operated on the site to feed the plant. A further doubling of this capacity is actively being considered.

Potential Mineral Processing Plants

The Yen/Australian Dollar exchange rate and increasing transportation costs are making the on-site processing of minerals and metal concentrates more attractive. However, the poor level of infrastructure development in Northwest Tasmania could hinder further mineral processing opportunities. Given adequate development and favourable markets the following projects could be possible:

Copper smelting

Copper Mines of Tasmania, the new operators of the Mount Lyell mine, are investigating the possibility of constructing a copper processing plant on site. This would be a major power consumer, and hence an upgrading of the supply would be required. The project would become more attractive if other copper deposits are discovered in the vicinity.

Hellyer tailings processing plant

A joint venture is being undertaken by Aberfoyle Resources Ltd and Tioxide (Australia) Ltd to investigate the use of sulphuric acid to recover zinc and other metals from the Hellyer mine tailings. If the project is successful, there will be a logistic requirement to move the acid to Hellyer. This will require improved transport systems. In addition, the plant could be a considerable energy consumer, of both natural gas and electric power.

Tin smelting

With the planned further development of the Renison tin mine, smelting of the concentrate on site could again become attractive.

Yolla Gas Field

Talks are continuing between the consortium holding a Retention Licence over the Yolla gas field and the Government. The onshore delivery of gas from the Yolla field is dependent on identification of a suitable market prior to future drilling to assess the size of the resource.

Dolerite super quarry

A large area of dolerite at Tippogorree Hills, near Bell Bay, is currently held under a Retention Licence. It is proposed to mine about one million tonnes of rock per year to supply the Pacific–Japan Region with building and road construction stone.

Magnesite processing

The substantial deposits of magnesite in the northwest area could provide the basis for a substantial industry producing calcined magnesia for environmental use. The use of the magnesite as a feedstock to a magnesium metal plant has also been considered, but even if the material is found to be suitable, the level of infrastructure development in the area is not sufficient to sustain an industry.

Other mineral processing possibilities

The Tasmanian Government is actively promoting the development of the area in the vicinity of the Port Latta pelletising plant as a future Heavy Industry Zone, given that the area has a history of this type of operation. Should this proceed, there would again be an increased need for infrastructure development in the region.

Infrastructure Requirements

Natural gas

Access to natural gas is an important element for several large projects currently being considered in Tasmania. These projects include copper smelting at Mt Lyell, magnesite processing, treatment of Hellyer tailings, and downstream processing of iron ore from Savage River. Except for the Savage River project, the absence of natural gas should not prevent these projects going ahead, but the availability of gas would greatly enhance their viability.

Power

The West Coast has a poor electricity supply system. Despite the fact that much of Tasmania's electricity is generated in western Tasmania, there are a number of limitations upon the system in that area. Any large development on the West Coast would require a much improved electrical infrastructure.

The requirements for a power system upgrade would include lines, substations and the channeling of power towards, rather than away from, the West Coast.

Road

Increased development on the West Coast is likely to lead to significant demands upon the current road network. While some roads on the West Coast have been recently reconstructed, large areas of the West Coast remain sub-standard for bulk transport by road.

It would be necessary to improve the road infrastructure on the West Coast to be able to withstand regular transport by heavy trucks.

Rail

The current rail system on the West Coast is a 134 kilometre long private line owned by Emu Bay Railway Company. This line runs from Melba Flats, south of Rosebery, through to Burnie, with a recently constructed branch line running into the Hellyer mine processing plant.

If rail is to continue to be an important part of the transport system then it would be necessary to upgrade the rail system and extend it to Port Latta and to other mines in the area.

Water

The West Coast has a high rainfall and ample reserves of water. However, Port Latta, the likely site of any major mineral processing operations in the northwest, does suffer from a limited water supply.

To supply 45 ML of water per day to Port Latta would require either a significant upgrade to the current pipeline from Savage River to Port Latta or the construction of a storage dam and pump station on the Dip or Black River, with a pipeline to Port Latta.

Air transport

The West Coast is currently serviced by two airports, one at Queenstown and the other at Strahan. However there is no longer any regular commuter service to either airport. The northwest airports at Wynyard and Devonport have regular interstate and intrastate services.

An improved air transport system would allow increased access to the area for staff and equipment.

Communications

The West Coast suffers from a limited telephone network. In particular, analogue mobile phones are presently unable to operate in large sections of the West Coast. The newer digital mobile phones can be be operated over parts of the West Coast.

Given the importance of communications to modern business operations, it would be beneficial to operations in the region to have access to an improved telephone network on the West Coast.

Phase 2 — Proposed Geoscience Component of the Project

The proposed project would involve aeromagnetic surveys over two areas — far northwestern Tasmania and that part of Bass Strait not yet covered by modern surveys.

The surveys would provide high quality (200 m line spacing) aeromagnetic and radiometric data of northwest Tasmania, west and north of the Arthur Lineament (see attached map), and aeromagnetic data over the area of Bass Strait, administrated by Tasmania, and not yet covered by AGSO surveys.

The new northwest Tasmania surveys would be combined with data from existing surveys, with a 1 km overlap in the case of high resolution onshore surveys and 3–4 km in the case of the AGSO offshore surveys.

In conjunction with these surveys, geological mapping is proposed for areas not yet covered by maps with an accuracy greater than 1:250 000. This mapping, to be undertaken by Mineral Resources Tasmania, would draw upon the detail of the new geophysical data.

APPENDIX 2
Detailed background for Project 4

SOUTHGOLD, MIDMIN and NORWESTMIN

The long-term viability of the Tasmanian mining industry depends on mineral exploration. With currently operating mines entering their mature stage, new deposits must be found so that they are ready to be brought on-stream as existing mines are exhausted.

To increase the area of Tasmania under exploration licence, the State needs to attract industry to areas not well explored by modern techniques. To do this, MRT proposes to develop up-to-date data packages over areas of the State where mineral exploration activity is not occurring but where some evidence of mineralisation is known.

To help accomplish this outcome, the ***aim*** of this new initiative is:

- to increase the area of Tasmania that is regarded as 'highly prospective' for metallic and non-metallic minerals.

The cost of the project will be $8 million over eight years at a rate of approximately $1 million per year. The first two years work will be aerial remote-sensing only, with acquisition of gravity data, stratigraphic drilling and back-up research and database development occurring over the following six years.

This project will provide up-to-date geophysical and geological data and create a competitive, increased and more effective mineral exploration investment climate in Tasmania. The project will provide excellent data and a major incentive to mineral and oil and gas exploration groups to invest in Tasmania, which is essential for the development of the mineral sector.

The project has specific data delivery targets and will be reviewed annually.

The project will provide a coverage of modern geophysical data over major areas of Tasmania currently regarded as having unknown mineral prospectivity, and will entail the acquisition of aeromagnetic, radiometric and gravity data over areas of Tasmania which are either not covered or are presently inadequately covered by these basic data sets.

The geophysical data, when used in conjunction with geological data, will allow industry to examine geological structures in three dimensions and assess prospectivity as part of their planning for exploration activities. These methods can be successfully used to map the geological structure in areas where prospective rocks are obscured by younger, non-mineralised cover rocks.

With such data Mineral Resources Tasmania will be able to assess the prospectivity of the eastern/southeastern part of Tasmania. This area is covered by dolerite and flat-lying sedimentary rocks but has the potential to be underlain by mineralised rocks similar to those found in western and northeastern Tasmania.

Basic data and assessment packages will be produced annually for, and promoted to, the mineral exploration industry and other interested parties.

The work will commence in the Maydena–Huon area (*SOUTHGOLD*), moving to the Midlands (*MIDMIN*) and finally to the far northwestern part of the State, where the mineral prospectivity has not been fully assessed (*NORWESTMIN*).

The programme is based on the existence of evidence which suggests that:

1. Mineral deposits similar to those of Western Tasmania may well be buried beneath the cover sequences of Central and South East Tasmania, and a systematic study is required to locate the prospective units.

2. There are known occurrences of, and potential for, industrial minerals and gold in exposed basement rocks in areas such as the Weld River and Maydena, and these areas will be mapped and assessed in the early stages of the project, with a view to encouraging further active exploration. Information gained from studies of the exposed basement windows will be important for interpreting the nature of the basement rocks in covered areas.

3. A significant amount of gold (estimated 3000 ounces) was won from the Cygnet goldfield around the turn of the century, from veins and alluvial sediments derived from Cretaceous syenite dykes. This poorly known gold field will be mapped and studied to determine the mode of occurrence of the gold and the potential of the field for further exploration.

Other occurrences of metallic and industrial minerals within the cover sequences will also be investigated. These include base metal sulphides and gold, in places associated with dolerite contacts, as well as stone, coal and aggregate resources.

The initiative will consist of a number of phases, which will include:

1. Assessment of the cover sequences in terms of thickness, nature of dolerite intrusions, and depth to basement etc., to assist in the interpretation of geophysics and targetting of drill holes to basement. Reconnaissance mapping and compilation of data on these sequences will be undertaken, commencing in the southeast area.

2. Aeromagnetic and gravity surveys will be conducted as part of the overall project, to assist in interpreting the basement structures and rock types. Funding for these surveys will be a major part of this initiative.

3. Deep drilling through the cover rocks to test for basement structures and rock types will be undertaken on the basis of the integrated geological–geophysical interpretations.

Background activities already under way

1. Mapping in Weld River area, and production of the Weld 1:25 000 scale geological map sheet. Compilation of two or three other sheets from existing mapping (probably Maydena, Skeleton, Nevada) in the Maydena–Weld area. Production of a report on the geology and prospectivity.

2. Mapping, sampling and laboratory studies (fluid inclusions, petrology, mineralogy, isotopes) of the Cygnet goldfield, and preparation of report on gold occurrence and prospectivity.

3. Compilation of existing data on cover sequences in the southeast area, combined with reconnaissance mapping (mainly road traverses) of strategic areas, to assist in the production of 1:25 000 scale geological maps of the Maydena–Weld area, and to provide assessment of cover thickness and possible basement structures. This work is to be on-going.

Future work

1. Mapping of basement windows in the Picton–Huon area; production of maps and report.

2. Further studies of mineralisation in cover sequences, including dolerite-related mineralisation.

3. Continued assessment of cover sequences in the southeast and central areas.

4. Detailed aeromagnetic coverage of selected areas of southeast Tasmania and infill gravity coverage.

5. Diamond drilling of selected basement target(s).

SOUTHGOLD

A revival of gold mining in southeast Tasmania is the aim of SOUTHGOLD. The Cygnet area was mined for gold around the turn of this century, yielding approximately 93 kg of metal, which would have a contemporary value of $1.5 million dollars.

Scientific data are needed to support the notion that further gold-bearing mineralisation occurs in the southeast. Such data would encourage exploration in the area, just as the NETGOLD project of 1993/94 resulted in a sharp rise in exploration in the northeast. Exploration brings its own economic benefits, as well as making discovery possible.

The *SOUTHGOLD* project will:

- Extend modern geophysical data coverage to the southeast;
- Generate new economic activity in the region;
- Capitalise on the expertise and experience gained by Mineral Resources Tasmania during the award-winning NETGOLD project;
- Launch an eight-year programme of geoscientific data gathering that will keep Tasmania competitive in the interstate and international race for exploration dollars.

As many of Tasmania's mines enter a mature stage in their development, it is imperative that new deposits be located to ensure the long-term viability of the industry. The State cannot afford the collapse of a sector that makes such a massive contribution to the State's economy.

To widen the surface area of Tasmania which is attractive to explorers, the State must extend the present coverage of up-to-date geophysical and geological information. In the northeast, 90% of land put out to tender in the NETGOLD project has been taken up by explorers encouraged by detailed data packages developed by MRT. In other parts of the State, where there may be very large mineral bodies but insufficient modern information to support an investment decision, there is little or no exploration.

SOUTHGOLD will be the first step in a systematic programme to address this lack of modern information. The project will focus on regions most likely to contain commercial minerals — both metallic and non-metallic. Target areas, aside from the southeast, include the extreme northwest and areas where the rims of a massive basin-like formation of potentially highly mineralised rock approach the surface. This rock basin, which appears to have similar characteristics to major West Coast mineral bodies, underlies the Midlands and is covered by surface deposits varying from relatively shallow to more than 1000 metres deep.

MIDMIN and NORWESTMIN

Tasmania has a number of active world-class mines, within a variety of geological rock associations, mainly in western Tasmania. There are also other proven mineral resources for which new technologies are now allowing extraction. Other, poorly-defined resources, will become viable following the development of new extraction or processing techniques.

Most of the areas of high prospectivity in western and northeastern Tasmania are already under active exploration for further mineral deposits. Thus, for the future of the mineral exploration industry, which at the moment is worth nearly $15 million a year to Tasmania, the prospectivity of other areas of Tasmania needs to be increased by the production of data packages and promotion, so that exploration commitments can be obtained from industry.

Two areas, one in the far northwest and the other over the Midlands area, have evidence of mineralisation but no modern data sets are available to entice exploration companies to explore these areas.

The aim of the *MIDMIN* and *NORWESTMIN* projects is to:

- determine the nature of the basement rocks;
- assess the potential for mineral deposits in the basement and cover sequences; and
- provide and promote data packages to encourage and assist exploration in these areas.

Much of Tasmania does not have a coverage of acceptable quality geophysical data. Mineral Resources Tasmania has acquired aeromagnetic data in parts of western and northeastern Tasmania since 1980, and gravity data have been collected since the 1960s. Although these data are still referred to by explorers, they are limited in utility by the levels of technology and available geological knowledge at the time of acquisition. The remainder of the State has only sparse reconnaissance coverage.

SOUTHGOLD, MIDMIN and *NORWESTMIN* are designed to achieve increased and sustainable development of the State's mineral exploration industry in order to create a competitive investment climate for growth in exploration for mineral deposits.

Funding

Year 1	Aeromagnetics and radiometrics	$1,005,000	$1,005,000
Year 2	Aeromagnetics and radiometrics	$960,000	$960,000
Year 3	Aeromagnetics and radiometrics	$480,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	$980,000
Year 4	Aeromagnetics and radiometrics	$480,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	$980,000
Year 5	Aeromagnetics and radiometrics	$480,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	$980,000
Year 6	Aeromagnetics and radiometrics	$500,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	$1,000,000
Year 7	Aeromagnetics and radiometrics	$500,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	$1,000,000
Year 8	Aeromagnetics and radiometrics	$420,000	
	Gravity	$100,000	
	Stratigraphic drilling	$300,000	
	Geological backup	$100,000	$920,000

APPENDIX 3
Detailed background for Project 8

Collation, on a Council area basis, of geological information to aid in the preparation of Planning Schemes

Project Title: Geoscientific information for land use planning

A growing segment of the Community Service work provided by Mineral Resources Tasmania is the provision of adequate geoscientific advice to councils in the review or preparation of their planning schemes. The State's development policy has been reformed by introduction of the environmental and planning package of legislation including the new *Local Government Act 1993*. The latter requires the regular review of planning schemes by councils. This, and council amalgamation, has caused the intensive review of local government planning schemes.

The new process of planning review provides an important opportunity for geoscientific information to be included at an early stage in the process. If such information is incorporated in an appropriate manner it will not only benefit administration at council and State level but, more importantly, will assist development applications and reduce the prospect of wasteful appeals.

Submissions to councils must be made to ensure consideration is given to the following matters in the drafting of planning schemes:

- Possible sterilisation of resources by subdivision or incompatible development;
- Attenuation distances between industry and residential development are maintained;
- Future resource needs of the community are addressed;
- Groundwater resources are given protection for future use;
- Groundwater is not polluted by landfill, sewage disposal or excessive septic tank run off or other waste disposals;
- Development is controlled in areas of identified and potential landslide;
- Soil salinity and erosion-prone areas are identified and inappropriate land use is prevented.

To be able to undertake this work the available geoscientific information needs to be collated and checked to provide for the specific requirements of councils, as they do not have the facility or experience to extract the information they need from our data as it is presently structured.

To enable us to service this fast growing market we need to be able to provide the following:

- Maps which identify geological issues specifically for the needs of land managers and planners;
- Identify existing inappropriate zoning in individual planning schemes;
- Maps which indicate regional resource inventories;
- Upgrade land stability and groundwater information into a form readily accessible to planners.

The Department has a function under the *Local Government Act (Section 36, Building and Miscellaneous Provisions) 1993* to declare landslide areas where considered appropriate. Large tracts of land throughout Tasmania are subject to unstable conditions and it is important that the Division is aware of areas where landslide risk is high, particularly in zones that may be developed for housing but also where other kinds of land use are proposed.

The mapping of areas with landslide risk on a regional scale can result in a significant input into regional planning decisions and it is necessary that such surveys continue to provide this basic information. Occasionally it will also be important to examine local areas where particular problems occur as a result of specific geological conditions.

As well as landslide risk, information related to other foundation problems such as expansive or reactive soil, soils with low bearing capacity, and soils having erosion potential should continue to be collected. The reasons for these problems and their relationship to geological conditions need to be identified so that decisions on appropriate land use can be made or adequate precautions can be taken.

MRT administers the *Groundwater Act 1985* and although groundwater use is not as great as in other States, it is expanding with time. The collection of groundwater information from specific assessment surveys (drilling, pump testing, quality analysis), data from private contractors, monitoring of groundwater use and quality variation, and ensuring significant contamination of groundwater does not take place are important functions to be continued.

An assessment of the groundwater resource has been undertaken in some areas but many other areas require assessment to provide adequate information for present and potential future users. More detailed information on groundwater prospectivity will decrease the risk associated with drilling for water, whether it be for stock, domestic irrigation or small town supplies.

As demand for water increases, groundwater will increasingly become an alternative to surface water and the ready availability of information on groundwater prospectivity will be a significant aid to decisions on where water supplies will be sourced. The production of groundwater maps and associated notes are seen as the best means of disseminating this information.

Compilation of groundwater information over regional zones of the State will allow all of the currently known information to be presented, with the ability to update as new data become available.

Information is currently being collected, mainly from contract drillers' reports, for presentation on a scale of 1:250 000 and covering the whole State. At this scale it will only be possible to extract broad regional information, and this will not replace the need to undertake specific assessments of particular areas or groundwater provinces.

Groundwater quality throughout much of the State is good and groundwater can be used for a range of purposes, e.g. almost always for stock, often for irrigation and garden, and in a significant number of locations it can be used for domestic supplies. There is a necessity to ensure that groundwater quality is maintained, as near as possible, to its present quality and that the resource is not contaminated by inappropriate land use.

Particular attention needs to be given to waste disposal (e.g. household, factory, abattoir, sewage, waste water) and the siting of the associated disposal facilities. Work in this field, in association with the Department of Environmental Land Management, has expanded rapidly in the last decade and needs to be continued to guard against groundwater contamination. The vulnerability of various aquifers to pollution will be included as part of the resource assessment surveys.

Monitoring of groundwater needs to be continued. Base data to indicate natural variations in water tables and changes in quality are currently being obtained. There is a need to monitor groundwater levels in areas of high use to determine whether recharge is sufficient to maintain the level of use, whether use can be expanded, or whether overuse is occurring.

This information is necessary to support the proclamation of groundwater areas or the application of well orders (*Groundwater Act*) so that use can be controlled. Monitoring of groundwater quality around particular facilities or to monitor the effects of new disposal techniques (e.g. land disposal of sewage) on groundwater quality will be required from time to time.

The building and construction industry is dependent upon a guaranteed supply of clay, sand, gravel and crushed metal for their continued operation. It is essential that new reserves are identified and suitably protected to ensure the long term viability of the industry. A source of material close to the main population centers is an important factor, as transport is a major component in the cost of supplying the material.

There is a growing concern that potential future sources of construction materials are being sterilised as a result of land use planning decisions. This issue is no more apparent than the situation with respect to the available sand resources remaining in the greater Hobart region, where some prospective source areas have already been lost through urban development.

Other potential major deposits, for example at Seven Mile Beach, have been sterilised be either prohibition or the placing of restrictions on extractive industries. It is important that planning decisions in the future accommodate and provide for rational access to these vital resources.