



**GEOSCIENCE PRIORITIES
FOR THE NEXT
AUSTRALIAN GOVERNMENT**

**Australian Geoscience Council
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Foreword

The Geosciences are very important for Australia. The mineral and petroleum industries are the main export earners for Australia; minerals and energy underpin our wealth creation, and the geosciences are needed to discover, develop and manage these resources. Our future prosperity will depend on these industries remaining healthy, innovative and competitive.

Furthermore, we are faced with huge challenges in respect of land degradation and deteriorating water quality across the whole continent. These issues also require input from the geosciences. We must aim to ensure that our land and water management practices will sustain productive and profitable land and water uses, as well as our natural environments.

Accordingly the Australian Geoscience Council believes that the next government should give a higher priority to the geoscience sector.

This document identifies ten key issues, which the AGC believes should be addressed by the next Australian government. They cover the health of our industries, the national infrastructure in respect of research and development, and above all the need to articulate national plans based on realisable objectives.

We do not pretend that the actions proposed will overcome all our challenges, but we do believe that they are all very important and should be addressed as high priority issues.

David Denham

President,
Australian Geoscience Council

GEOSCIENCE PRIORITIES FOR THE NEXT AUSTRALIAN GOVERNMENT

SUMMARY

The next Australian Government should act to further develop:

- *the growth of healthy and competitive resource industries in Australia, because of their vital contribution to the wealth of the nation, and,*
- *national plans and remedial actions to address land degradation and deteriorating water quality, to ensure that our land and water management practices will sustain productive and profitable land and water uses, as well as our natural environments.*

Accordingly the AGC recommends the following Government actions:

- ◆ Convene meetings with stakeholders to simplify the complex processes currently involved with land access for mineral and petroleum exploration and resource development.
- ◆ Provide appropriate financial incentives to encourage mineral and petroleum exploration, particularly in greenfield areas and by the smaller companies.
- ◆ Build on the present Innovation Action Plan to create a blueprint for long term national investment in our science and technology base.
- ◆ Strengthen the teaching and research infrastructure in tertiary institutions so that the R & D capacity and capability are available to use our natural resources in a responsible manner.
- ◆ Develop and implement a national plan, based on key scientific evidence, to address land degradation and water quality issues.
- ◆ Negotiate with the major minerals and petroleum resource companies operating in Australia to develop a plan to reverse the downward trend for R&D investment in Australia by that sector.
- ◆ Rejuvenate AGSO-Geoscience Australia as the national geoscience institution by:
 - increasing its resources so that it can cooperate fully with the State and Territory Governments on regional onshore programs and increase its programs on geoscience research;
 - coordinating national geoscience programs on groundwater and land degradation; and
 - instituting an AGSO Board, responsible to the Minister, comprising key stakeholders and clients, to provide formal feedback/advice on its programs.
- ◆ Implement the Productivity Commission's Report on *Cost Recovery* so that 'core' information in 'Information' Government agencies such as AGSO, ABS and ABARE are not subject to cost recovery.
- ◆ Increase the funding to CSIRO so that it is less dependent on external earnings and is able to concentrate more on longer-term strategic research.
- ◆ Repeal Section 17 of the Australian Citizenship Act 1948, to make it easier for Australian scientists who have taken out foreign citizenship to return home and work in Australia.

Land Access for Exploration and Resource Development

The Mineral and Petroleum Industries are the main export earners for Australia; minerals and energy underpin wealth creation in Australia. The value of these exports is expected to rise from \$44 billion in 1999/00 to about \$54 billion in 2000/01, significantly more than exports from either the farming, manufacturing or service industry sectors.

Exploration is the lifeblood of the minerals and petroleum resource industries; without exploration these industries cannot be sustained. One of the main challenges at present is the uncertainty and complications associated with land tenure for exploration/mining arising from the implementation of the Native Title Act 1993.

The AGC supports the principle of Native Title. We recognise that Aboriginal heritage, culture and land custodianship must be protected, with appropriate wealth sharing at the mining/production stage, when the new wealth is generated. However, the present arrangements inhibit exploration by the very complexity of the processes in place. It appears that large amounts of money are being spent on legal advice, and the aboriginal community appears to receive little or no benefits.

Only the largest mining companies can now afford the time and expense to gain access to land. However, companies like BHP/Billiton and Rio Tinto prefer to grow through the acquisition of smaller companies. Several of these have decided to shift their exploration focus away from Australia to other countries where it is easier to explore. With the exploration activity currently running at close to half the level it was at the start of 1997 the minerals industry is very depressed and will become unsustainable if exploration investment does not recover. On shore levels of exploration for oil and gas have fallen similarly. Simplifying the arrangements for 'Land Access' to explore is crucial for the recovery to take place.

The AGC believes that the way forward is to work for a nationally uniform system of education, information and communication processes with Aboriginal landowners/custodians as an integral part of Reconciliation with a particular emphasis upon Aboriginal economic advancement at the community level.

We see the need for:

1. An upgraded Education-Information Communication Process (EICP) between Aboriginal landowners and those wishing to access land,
2. Integration of Aboriginal local (community) and regional (ATSIC) government into the EICP,
3. Minimisation of legal and anthropological costs (pre-and syn-access) in EICP,
4. Optimisation of Aboriginal control and management of EICP,
5. National standardisation and progressive accumulation of maps, registers and databases for Aboriginal sacred/significant sites and areas and progressive incorporation of same in State/Territory cadastres, involving once-only clearance processes,
6. Special initiative by the Australian exploration industry to help upgrade water supplies in remote Aboriginal communities (per a conjunctive commitment to drill at least one waterbore in each drilling program on Aboriginal land, if landowners so request),
7. Significantly expanded commitments to Aboriginal education, training and employment by explorers per tripartite industry-government-Aboriginal steering groups (with particular emphases upon Geoscience courses at TAFE and Higher Ed levels relevant to Aboriginal needs and on the job training), and,
8. Endorsement of Aboriginal economic development generally and of small business enterprises specifically at the community level which are catalysed by relationships with explorers and which have a nexus with geoscience via exploration, mining, tourism, aquaculture, horticulture, arts and crafts, land management/rehabilitation, essential services (e.g. roads, water supplies) etc.

Financial Incentives for Exploration and Development

At present there is intense global competition for exploration investment as mineral and petroleum resource companies are operating more and more on a global scale. It is important that, in Australia, we have an appropriate taxation/financial environment in place to attract both Australian and overseas investment in exploration.

For example in October 2000, the Canadian Federal government introduced a 15% non-refundable tax credit for explorers. The credit is in addition to the existing 100% deduction of eligible exploration expenditures. It is specifically designed to encourage higher risk 'greenfield' mineral exploration (excluding coal, bituminous sands or oil shale exploration) and the regulations are framed accordingly.

In Australia, with the larger companies such as BHP/ Billiton and Rio Tinto preferring to grow through the acquisition of smaller companies, exploration activity has declined significantly in the last four years.

In 1993 the exploration budget for CRA (now part of Rio Tinto) was \$150M in Australia and overseas, but managed from Australia. In 1999 it was \$13M. At least 100 people were retrenched and a special purpose building in Melbourne, which used to hold 100 people now holds no Rio Tinto staff. The Sydney office closed in the late 1990's and the headquarters was moved from Melbourne to London.

From mid-1997 to the end of 1998 BHP cut its exploration budget by about 40% and this was followed by extensive retrenchments. Since the recent merger with Billiton the Head of the Petroleum Division has moved to London.

Apart from the overall reduction in exploration across the board, the following major companies have been taken over in the last four years and their exploration budgets have consequently vanished: Aberfoyle Resources, North, RGC, Acacia, Ashton, Plutonic, North Flinders, Tanami, Mt Leyshon, Savage Resources and Ross Mining.

To stimulate new exploration activity, the AGC recommends the introduction of financial incentives, particularly for the smaller companies. Some of the possible options are listed below. These, and any other proposals, would have to be worked through by governments and industry:

- Specific incentives for exploration in greenfield areas, where new data are collected and processed. These could be in the form of a subsidy if the data are made available in the public domain, or as additional tax concessions.
- A subsidy of the total cost of the first hole in each greenfield drilling program for holes deeper than 300 m and capped at say \$20 000.
- Full (100%) offset of costs of new data against future production royalties should be standardised nationally.
- A simple tax-deduction system that would allow investors the ability to claim tax losses, resulting from mineral exploration deductions against other income be introduced. We suggest that a statement be issued annually to shareholders along the lines of a normal dividend certificate. The company would issue this statement to shareholders stating that xx cents per share held can be claimed as a tax deduction for valid exploration expenditure. This statement could be lodged with an annual income tax return of the shareholder enabling a tax deduction to be claimed. This would be recognition by the government that mineral exploration is valid scientific research.

Innovation and Action Plan 2001

The Innovation Action Plan: *Backing Australia's Ability*, which was launched by the Prime Minister in January this year, was an excellent first step to increase the nation's investment in science and technology. It was a clear recognition that we need to invest in science and research to ensure that we can develop the sustainable industries for the future.

The package committed \$2.9 billion over five years in a mix of programs including encouragement for industry to innovate, new laboratories and facilities, and support for basic research.

The new Government should confirm that it is committed to this program particularly the component that backs the increased funds for basic research through the ARC.

The package did not, however, address critical funding problems in CSIRO and AGSO. These agencies provide technology, knowledge and data that have been in the past a major factor in attracting exploration expenditure.

The document is also weak on innovation relating to energy and the resource industries. Because these sectors are crucial in the context of the wealth of the nation, it is essential for them to be included in the innovation landscape.

There is a clear need for government leadership in the resource sector because of the importance pre-competitive geoscience information in generating exploration activity and new mineral deposits (Australian Mineral Exploration New Frontiers and Opportunities PMSEIC report to Cabinet June 2001). The steady decline in Commonwealth government investment in these sectors over the last five years has led to a general rundown in the research capabilities and capacities of these industries. This situation needs to be remedied urgently.

Research and Teaching Infrastructures in Tertiary Institutions

We are vitally concerned with the health of the public university sector, particularly in the core geoscience disciplines of geology, geophysics and geochemistry, along with the associated technologies such as mining engineering, mineral processing, and environmental management.

These subjects are crucial to underpin the economic well being of Australia, now and in the foreseeable future.

Some of the more important decisions the Australian community will make in the decades ahead relate to our stewardship of the Earth. We need to have available the technical capability and capacity to make and implement these key decisions, and the general community needs a basic understanding of how our planet works.

Universities have a vital role in these matters, however, at a time when investment in science and technology is the key to the quality of life and a healthy economy, the investment in the tertiary sector by the Commonwealth has been declining steadily and is completely inadequate.

When many of our OECD partners such as Canada, Sweden and the UK are increasing their public investment in the sciences at the tertiary level, in Australia the reverse is taking place. Consequently, the AGC believes that unless the downward trend of government support is halted, there will be a shortfall in satisfactory staffers for geoscience disciplines that are growing in importance (hydrogeology, engineering geology, environmental geology, exploration geophysics, regolith geology). It is also likely that in the present environment, universities may not have the funds to initiate or expand courses in these areas.

The causes of potential staff shortages are diverse, but certainly include limited research opportunities in Australia, isolation from peers, lack of opportunity to engage in cutting-edge research and research training, and the perceived need to devote excessive time to administration and fund raising. Low salaries are also a problem with the declining A\$ and the changes in salary relativities between academia and other parts of the work force in Australia. Average salaries for our academics are consistently low compared to equivalent positions in Canada, Hong Kong, and Singapore. Assistant lecturers, lecturers, senior lecturers, associate professors and professors in Hong Kong earned between two and three times more than their Australian counterparts in 1996.

In a nutshell there must be a major increase in Commonwealth support for our tertiary institutions.

National Action Plan to Address Land Degradation and Water Quality Issues

Australia has critical salinity and water quality problems demanding urgent attention:

- At least 2.5 million hectares (5% of cultivated land) is currently affected by dryland salinity - this could rise to 12 million hectares (22%) at the current rate of increase.
- One third of Australian rivers are in extremely poor condition - within 20 years Adelaide's drinking water will fail World Health Organisation salinity standards in 2 days out of 5.
- Land and water degradation, excluding weeds and pests, is estimated to cost up to \$3.5 billion per year. (In addition dryland salinity has adversely affected biodiversity, eg. CSIRO estimates a resultant reduction in bird species of 50% in agricultural areas).
- Infrastructure (buildings, roads, etc) is being severely damaged in many rural urban centres.

In October 2000, the Federal Government committed \$700 million towards a comprehensive national strategy to address salinity and water quality problems, two of the most significant issues confronting Australia. This was an excellent first step and actions have already taken place in several areas to tackle some of the problems.

However, the AGC is disappointed at the slow progress made to date with this investment and the absence of a national science plan to address regional issues.

The AGC believes that more urgency should be shown by the Federal Government to develop a national plan, to make this plan publicly available, and to coordinate the implementation of the plan.

The recent Audit Report by the Auditor General on *Performance Information for Commonwealth Financial Assistance under the Natural Heritage Trust* identifies the current deficiencies in these national continent-wide programs of the NHT, where there has been inadequate monitoring and little or no analysis of the effectiveness of the programs.

The national plan should also include consideration of waste disposal and pollution issues. These factors should be included because they are crucial to the sustainable management of our land and water resources and require major inputs from the geosciences.

Levels of R & D in Resource Sector Industries

In the last three years there has been a huge decrease in the R & D investment by minerals and petroleum resource industries operating in Australia. According to the Australian Bureau of Statistics, the investment by these industries during 1999/00 is only 39% of the R & D investment during 1996/97.

A large contributing factor to this decline is the rationalisation and globalisation of this industry, which has taken place during this period. For example, the exploration activity in the mineral industry is currently less than 60% of the level in was in 1997.

In the petroleum sector, Esso, which has a major exploration and development program in Australia undertakes very little research here, and several other companies that derive large cash flows from Australia invest only a very small percentage of these proceeds into Australian R&D.

The AGC believes that the Government should hold talks with the major multinationals operating in Australia to reverse this trend because at present Australia is losing its basic geoscience research capacity and capability in an alarming way.

AGSO-Geoscience Australia

After the 1998 Election, the Land and Water sections of AGSO were moved to the Bureau of Rural Sciences and extra money for joint programs with the States and the Northern Territory was withdrawn.

The logic behind these actions has never been satisfactorily explained. The AGC believes that the science/research, mapping and databases associated with land degradation and ground water should be contained within the national geological survey, or some other equivalent organisation.

The ground water and petroleum flow characteristics through the Earth are similar, and both these valuable fluids are hosted in sediments beneath the Earth's surface. Furthermore, the techniques and data sets used to study ground water and land degradation are common to many used in the resource sectors. These issues should be dealt with in the same national institution.

The AGC believes that the cuts to AGSO's onshore programs should be reversed. The States and Territories can only work piecemeal within their own boundaries, and most of their programs rely on well-established techniques. They cannot provide by themselves the major research facilities needed to tackle continent-wide problems, which cover state boundaries. This is clearly the Commonwealth's role through AGSO. Given the importance of the geosciences in maintaining our export earnings we believe the Commonwealth should show a greater commitment to national investments in geoscience R & D.

At present AGSO does not have a formal mechanism for linking its stakeholders and clients into the program development and delivery stages. The AGC believes that an AGSO Board, reporting to the Minister, be established to rectify this situation. The Board should comprise members representing stakeholders and customers, and should provide AGSO with information on the requirements of industry, the research community and society in general.

Cost Recovery

The information generated by agencies such as AGSO, ABARE, ABS and AUSLIG are vital in developing wealth for the nation. Of particular concern are the data provided by AGSO, which are widely used in the mineral and petroleum exploration industries, as well as by CSIRO and universities, as inputs for research programs and teaching resources.

One of the key functions of AGSO is to provide geoscience information to encourage mineral and petroleum exploration. With the current pricing arrangements, only the larger exploration companies can afford to use its important regional geophysical data sets, and hence its current pricing policy is inhibiting the outcomes of its core business.

The State/Territory Geological Surveys have reduced the prices for their data significantly in recent years so that these are used as widely as possible, and the NT Survey provides data sets free of charge. This policy has resulted in an increase in exploration activity and in the long term will, we believe, pay off handsomely in terms of generating national wealth.

We would also propose that consideration be given to reducing the prices of '*non-core information*' after a fixed time period of say three years, so that these data sets are eventually available in the public domain outside the cost recovery framework. After all, government information agencies were originally established to provide public good services and products, and activities, which may at present appear to be non-core could well be of general interest in the future.

The AGC recommends that information generated during core business in 'Information' Government agencies such as AGSO, ABS and ABARE should be provided free of charge or at cost of transfer, as recommended in the Productivity Commission's 2001 Report on Cost Recovery. The high prices currently charged by some agencies for data are such that they impede the agencies achieving their main goals.

Non-core activities of information agencies should be charged at marginal-rate, at prices that are consistent with competitive neutrality principles and the data sets gathered under this activity should be provided free of charge after five years.

Bringing the Boys and Girls Back Home

In the present global environment, technical specialists are working throughout the world, learning new skills and gaining new experiences. There are many well-qualified Australians working overseas in the US and Europe. If these scientists need to take out another citizenship to further their careers or to gain research grants then, in accordance with Section 17 of the *Australian Citizenship Act 1948*, they immediately forfeit their Australian citizenship.

“Section 17 Loss of citizenship on acquisition of another nationality (1) A person, being an Australian citizen who has attained the age of 18 years, who does any act or thing:

(a) the sole or dominant purpose of which; and
(b) the effect of which; is to acquire the nationality or citizenship of a foreign country, shall, upon that acquisition, cease to be an Australian citizen.”

The AGC believes that this Act discriminates against people born in Australia and places unnecessary restrictions on scientists wishing to return to Australia to work. We can see no justification for maintaining this section of the Act, in this day and age, and urge that it be repealed forthwith. In fact at present the present Act discriminates against Australian citizens born in Australia, compared to Australian citizens born overseas.

Basically, science, technology and business are global. Scientists have skills that are marketable in, and transferable between, many countries. Top Australian scientists are attracted to work overseas where they can earn much higher salaries and gain valuable experience. Many, but not all, eventually return to Australia, which they regard as their 'home'. Policies should be in place to facilitate this.

Similarly, Australia needs to attract scientists from overseas to work here. These scientists are often foreign nationals who do not want to give up their citizenship, but want to work here for a number of years (sometimes indefinitely) due to lifestyle choices and varied experiences. Australia should do all it can to attract foreign scientists to Australia, to contribute to our knowledge base and industries. Many of the immigration laws make this difficult, particularly for work within government organisations such as CSIRO, ANSTO, and AIMS.

CSIRO

CSIRO is Australia's main research organisation. It has helped Australia's largest and most dynamic industries grow and prosper.

CSIRO scientists work in many areas that are vital to Australia's future, the economy, our jobs and our living standard. These include agriculture, minerals and energy, manufacturing, communication, information technology, construction, health and the environment. It has 6500 staff and more than 65 research locations across the continent.

CSIRO scientists work for 22 major sectors of the Australian economy often in partnership with industry, government and other scientific organisations.

However, in recent years CSIRO's budget from government has gradually declined, when compared to the GDP, and it has to earn at least one third of its budget from external sources (CSIRO's total budget is now ~\$700 million). In the geoscience areas this target is approximately 45% and it is not generally recognized that this imposes a requirement at the research project level to generate over 60% of funds from external sources.

This has resulted in a decline in the longer-term strategic research effort, a distorting effect on the entire budget caused by external earnings' targets, and restrictions on the outputs from the research being available in the public domain.

The AGC considers this situation to be unsatisfactory, in terms on value for the taxpayer's dollar, and recommends that the core budget for CSIRO be increased by 15 percent, to make-up for the cuts in government appropriation over the last few years, so that it has the capacity to undertake longer term strategic research.

This would allow for the organisation to establish a core program of strategic research and to ensure that this is adequately funded.

THE AUSTRALIAN GEOSCIENCE COUNCIL

The Australian Geoscience Council comprises representatives of nine major Australian geoscientific societies and represents over 7000 members of the geoscientific profession.

It provides a forum for representatives of geoscientific societies and organisations to cooperate and to encourage the development of the earth sciences in Australia; particularly in recognition of the vital contribution that the application of geoscience makes to our quality of life and economic prosperity.

The objective of the Australian Geoscience Council is to represent the broad range of earth science professions in order to:

- **Provide expert apolitical advice to government on matters involving the earth sciences and their application;**
- **Promote the development of scientifically sound policies for effective earth science education and research; and,**
- **Provide the Australian public with a greater appreciation of the economic, environmental and cultural values of the earth sciences.**

The Council has been recognised as the peak body for the geoscientific professions by the Australian Research Council; the Department of Employment, Training and Youth Affairs and the Federation of Australian Scientific and Technological Societies.

Council Membership

**Association of Exploration Geochemists
Australasian Institute of Mining and Metallurgy
Australian Geoscience Information Association
Australian Institute of Geoscientists
Australian National Chapter, International Association of Hydrogeologists
Australian Quaternary Association
Australian Society of Exploration Geophysicists
Geological Society of Australia
Petroleum Exploration Society of Australia**

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