25 February 1991

The Honourable P J Keating, M.P.
The Treasurer
Parliament House
CANBERRA ACT 2600

Dear Treasurer

In accordance with Section 7 of the Industry Commission Act 1989, we have pleasure in submitting to you the report on Mining and Minerals Processing in Australia.

Yours sincerely

D. McBride  K. J. Horton-Stephens
Presiding Commission  Commissioner

Professor R. Blandy  B. Smith
Associate Commissioner  Associate Commissioner
Acknowledgements

The Commission wishes to thank those staff members who contributed to this report.
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The Overview which appears at the front of volume 1 is also available as a separate document.
Terms of Reference

I, PAUL JOHN KEATING, in pursuance of Section 23 of the Industries Assistance Commission Act 1973 hereby:

(1) refer the mining industry (as defined by Division B of the Australian Standard Industry Classification), excluding petroleum and petroleum products, and minerals processing for inquiry and report by 28 February 1991

(2) specify that in respect of (1) above, the Commission's inquiry and report cover value added processing of minerals, including coal, to the unwrought refined metal and alloy stage or the equivalent stage of processing of coal and industrial minerals

(3) specify that the Commission report on any institutional, regulatory or other arrangements subject to influence by governments in Australia which lead to inefficient resource use, and advise on courses of action to reduce or remove such inefficiencies

(4) without limiting the generality of this reference, request that the Commission examine

(a) factors affecting minerals exploration and development, including allocation of mineral property rights and construction costs in remote sites

(b) operating costs such as energy, transport and labour costs (including on-costs) and the availability of these inputs

(c) other factors such as access to technology and the level of research and development which may be impeding the efficiency, international competitiveness and further development of Australia's mining and minerals processing industry

(5) specify that the Commission: (a) have regard to established social and environmental objectives of governments and ongoing processes, including before the Resource Assessment Commission, (b) consider the structure and efficiency of Commonwealth and State Government resource taxation and royalty arrangements, (c) and provide advice on the economic costs of different approaches to those objectives consistent with an appropriate return to the community for the exploitation of public resources

(6) specify that the Commission is free to hold public hearings in advance of releasing a draft report and to take evidence and make recommendations on any matters relevant to its inquiry under this reference.

P.J. KEATING

18 October 1989
Mining and mineral processing in Australia - a short tour: 1

Gross domestic product by industry, 1988-89

<table>
<thead>
<tr>
<th>Industry</th>
<th>GDP %</th>
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<tr>
<td>Agriculture</td>
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<tr>
<td>Mining</td>
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<td>Manufacturing</td>
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<td>Construction</td>
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<td>Services</td>
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<td>Retail</td>
<td>2%</td>
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<tr>
<td>Transport</td>
<td>5%</td>
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Source: ABS 1990a

Employment by industry, 1988-89

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<tr>
<th>Industry</th>
<th>Employment %</th>
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<tbody>
<tr>
<td>Agriculture</td>
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<td>Mining</td>
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<td>Retail</td>
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<td>Transport</td>
<td>5%</td>
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</table>

Source: ABS 1990a

Note: MMP comprises the Mining and Basic metal products industries

Private new capital expenditure by industry, 1988-89

<table>
<thead>
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<th>Industry</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Agriculture</td>
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<td>Mining</td>
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<td>Manufacturing</td>
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<td>Construction</td>
<td>15%</td>
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<td>Services</td>
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<td>Retail</td>
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<tr>
<td>Transport</td>
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</table>

Source: ABS 1990b

An indication of the importance of mining and early-stage minerals processing to the Australian economy is that these industries account for almost a tenth of national output (and an even higher proportion of investment spending), while employing only just over 2 per cent of the workforce. The high productivity of miners is illustrated below where trends in output per employee and per person hour are reported.

Trends in output per person hour

Source: ABS 1990a

Trends in output per employee

Source: ABS 1990a
Mining and mineral processing in Australia - a short tour: 2

Trends in real commodity prices

Source: ABARE 1989

That productivity has to be high and continually increasing in our mining and mineral processing industries is illustrated by the figure above, which shows that mine and processed outputs must be produced ever more cheaply in order to achieve sales on world markets.Offsetting these pressures to some degree has been a generally weakening Australian dollar, which has meant that revenues in domestic currency terms have not fallen as much as has been the case in terms of the currencies of our major trading partners.

$A/$US exchange rate

Source: ABS Cat. No. 5301.0

Trade weighted index

Source: ABS Cat. No. 5301.0
Mining and mineral processing in Australia - a short tour: 3

Exports by industry of origin, 1989-90

- Black coal $5840m
- Diamonds $255m
- Lead $847m
- Copper $690m
- Nickel $775m
- Zinc $1164m
- Aluminium $2112m
- Iron ore & pellets $2100m
- Others $2212m

Total: $21 801 million
Source: ABARE 1990

Imports by industry of origin, 1989-90

- Others $2299m
- Phosphate rock $595m
- Phosphorus $17m
- Potassium fertiliser $43
- Sulfur $37m
- Gold $223m
- Iron ore & pellets $1950m
- Diamonds $125m

Total: $1 086 million
Source: ABARE 1990

Australia enjoys a comparative advantage in mining and early-stage mineral processing of some minerals. This is reflected in the large trade surplus (value of exports minus value of imports) we run in mineral commodities. Australia is among the world's leading exporters of coal, gold, iron ore, alumina, aluminium, zinc, lead and mineral sands.

Balance of mineral trade

$ million

OVERVIEW

This inquiry comes at a crucial time for the mining and minerals processing industries and, indeed, for the Australian economy as a whole. After receiving a great deal of material addressing key inquiry issues and as a result of its own research, the Commission is convinced that the potential of mineral resource based industries - in terms of the contribution they could make to the Australian economy - has yet to be realised. This is despite the fact that activities under reference already account for almost a tenth of gross domestic product, half of merchandise exports and often upwards of a fifth of annual investment spending. A major reason for this underperformance is that mining and early-stage mineral processing activities are hindered by numerous impediments. The Commonwealth and State/Territory and local governments are largely to blame for this sorry state of affairs, however well meaning and apparently justified the intent of their myriad interventions. But this conclusion should not be interpreted as merely pro-mining. Rather, the Commission would wish to see a situation emerge as quickly as possible in which mining and processing activities shoulder properly attributable costs - but only those costs. Stripping away unnecessary regulation and simplifying the remainder, combined with successfully addressing impediments in other areas of the economy which restrain mining, would dramatically improve the cost competitiveness of these industries. This could be partially offset by the imposition on the activities under reference in this inquiry of any necessary additional costs associated with maintaining an acceptable and habitable natural environment. Importantly, acceptance of recommendations contained in this report should lead to more `value adding' activity being undertaken in this country.

What is at stake?

An underlying thrust of this report is to address the issue of how Australia could sell more mineral resource based products, either as raw materials or in progressively more processed form - while at the same time containing adverse environmental effects associated with these activities within acceptable limits. Success in this endeavour would increase national income and thus the average material living standards of all Australians. Or, to put it another way, how could Australia realise the `clever country' status to which it aspires as far as our mining and minerals processing industries are concerned?

Current government policies toward exploration, mining and minerals processing activities are not `clever'. It is not clever to erect a whole array of impediments to one of the few industries in which Australia enjoys a clear advantage relative to many of our competitors. If we could dismantle just some of the barriers preventing these activities from realising their full potential, the Commission has estimated that the value of resource sector outputs could be boosted by some $5 billion annually, translating to annual gains of the order of $10 billion on an economy-wide basis.
While reforms aimed at achieving quantifiable gains are clearly worth pursuing, the Commission considers that even greater benefits would result from implementing other reforms identified in this report - but whose likely effects are less amenable to quantification.

Adoption of the Commission's recommendations (which are brought together at the end of this Overview) would result in a much more efficient mining and minerals processing sector. As suggested above, this would also lead to a large increase in national income and wealth, and hence material living standards - as well as contributing to a more congenial and habitable natural environment.

What needs to be done and by whom?

**Necessary reforms identified in this report include:**

- clarifying the rights of Aborigines and rural and urban landholders versus the rights of those wishing to explore for and mine minerals found on land where such activities will detract from the value attaching to surface rights;

- increased reliance on market mechanisms to solve land-use conflicts and introduction of procedures which allow objective assessments to be made of likely social costs and benefits when determining access to publicly owned land for exploration/mining and other purposes, thereby encouraging greater certainty and confidence in the decision-making processes of governments in Australia;

- adoption of more efficient means of allocating and charging for mineral rights;

- modifications to a range of existing taxation arrangements affecting mining and minerals processing activities which unnecessarily distort decision making, leading to an inefficient allocation of the nation's resources;

- improved mechanisms for dealing with environmental effects of mining and related mineral processing activities, to ensure that the industry shoulders its share of attributable costs (but only those costs) associated with containing adverse environmental impacts within acceptable limits;

- reduction in and rationalisation of regulation applying to mining and minerals processing activities;

- achievement of efficiency gains by increasing the contestability of transport services provided by rail and coastal shipping (including the waterfront);

- achievement of efficiency gains in the electricity supply industry by promoting competition within the industry;

- workplace-oriented labour market initiatives aimed at developing better relations between employers and employees in industries which have hitherto been characterised by often bitter confrontation;
• reduced government interference in mineral trade and regulation of the coal and uranium industries; and

• continued reductions in tariff (and other) assistance - particularly to non-mining activities.

While progress on these and the many other reforms advocated in this report will require action by all parties - including the industry, unions and community interest groups - governments must take the lead.

This should not be interpreted as advocating more government regulation of resource-based industries. Rather, the general direction of change should be towards governments vacating many areas of intervention, and restricting their role to the creation of an environment in which market-based processes can work more effectively. Thus, for example, in addressing the problem of overuse by the mining industry of services provided by the natural environment, greater reliance should be placed on solutions which rely on incentives provided by normal market forces (such as invoking the 'polluter pays' principle) - rather than on approaches which rely entirely on the dead hand of government regulation.

The Commission recognises that it is State and Territory governments which primarily influence the development of Australia's mineral resources. Much of what needs to be done therefore needs to be done by the States/Territories (to which this report is as much addressed as it is to the Commonwealth Government). Reform in many areas will require co-operation and consultation between the Commonwealth and the States/Territories. The most obvious need for this is in the area of environmental management and regulation. Others include transport, energy and taxation.

Although many issues addressed by this inquiry are interlinked (eg mechanisms for allocating and charging for mineral rights), so that the full benefits of reform may require changes in several areas simultaneously, the Commission stresses that substantial improvements could be secured from implementing many individual recommendations contained in this report.

**The resource sector and its links with other activities**

Australia is well endowed with mineral resources, some of which occur as world-class deposits situated fairly close to deep-water ports. This means that we enjoy a significant advantage relative to some of our competitors in mining, but not necessarily in minerals processing - where factors other than easy access to raw materials are important determinants of comparative advantage.

Apart from being an important sector in its own right, mining and minerals processing share important links with other industries in the economy (eg to suppliers of transport services and investment goods). This means that booms and busts in activities under reference in this inquiry will lead to fluctuations in output, employment and incomes elsewhere in the economy - particularly in the short run.

Given the strong export orientation of the sector, the pattern and extent of world economic growth, and the trade policies of foreign governments, influence the fortunes of our mining and minerals processing sector more than most domestic industries. Nevertheless, policies pursued by Australian governments and impediments of domestic origin often play an equal, if not more important, role in influencing the economic performance of the sector. Moreover, domestic
problems and impediments are (or should be) easier to remedy than trying to change how the rest of the world treats us.

The inquiry and the Commission's approach

This report focuses on what governments in Australia (at the federal, state and local level) can do to improve the efficiency and competitiveness of mining and early-stage mineral processing activities in this country.

From the perspective of the industry:

- access to land for exploration and mining;
- the way in which governments allocate and charge for mineral rights;
- mining/minerals processing project approval procedures;
- mine development, construction and operating costs;
- additional costs involved in further processing minerals;
- marketing of our mine and smelter/refinery products;
- environmental aspects of mining and minerals processing; and
- taxation of these activities generally

were all regarded as important issues, and the source of perceived problems.

There is also general interest in the effects mining and mineral processing have on the environment, and whether miners/processors are taking appropriate action to contain adverse environmental effects within acceptable limits.

All these issues and concerns involve Australian governments to a greater or lesser degree. They (and other factors not subject to government influence) all affect the competitiveness of the mining and mineral processing sector in this country, and aspects of all of them constitute impediments to the sector's contribution to the economy.

As required under the guidelines set down in the Act under which it operates, the Commission - in reviewing the activities under reference - is required to have regard to the desire of the Commonwealth Government to:

- encourage the development and growth of Australian industries that are efficient in their use of resources, self-reliant, enterprising, innovative and internationally competitive;
- facilitate adjustment to structural changes in the economy and to ease social and economic hardships arising from those changes;
• reduce regulation of industry (including regulation by the States and Territories) where this is consistent with the social and economic goals of the Commonwealth Government; and

• recognise the interests of industries, consumers and the community, likely to be affected by measures proposed by the Commission.

The Commission wishes to emphasise at the outset that it is neither ‘pro-mining’ nor ‘anti-mining’. Instead, the Commission wishes to see the situation emerge as quickly as possible where impediments to the efficient development of mining and mineral processing are removed, so that these activities shoulder properly attributable costs - but only those costs. In particular, such costs would include those necessary to achieve satisfactory environmental impacts of mining and mineral processing activities.

Access to land

Successful exploration, which needs access to large tracts of land compared to the area being mined at any time, is clearly crucial to the continued existence of mining and mineral processing industries in this country (and the wealth that these activities create). Judging by submissions to this inquiry, access to land for exploration and mining purposes is seen as the single most important issue facing the mining industry today. It is also one which is influenced greatly by governments, since most of the continent is still in Crown ownership (although much of it is leased to various categories of landholders - who usually have to be consulted about access).

Who should own minerals in Australia?

From its origins in medieval times when the Crown claimed royal prerogative to the noble metals (principally to finance its wars), governments of common law countries have progressively laid claim to minerals on behalf of the people they represent - on grounds that they are fortuitous ‘gifts of nature’ and that any net benefits flowing from their exploitation should accrue to the community as a whole, rather than to whoever happens to own the surface rights. Australia proved no exception in this regard, with the colonies progressively opting to reserve minerals from land grants. Thus, although minerals in Australia have not always been owned by the Crown (and some mineral rights are still exercised privately), in practice, control over exploration and mineral development is largely exercised by State and Territory governments (with the Commonwealth exercising control offshore).

This system, which often leads to conflict because surface and sub-surface rights over the same land are being exercised independently, was nevertheless not seriously questioned by most inquiry participants. However, it is not self-evident that the Australian system of Crown ownership of minerals (whereby governments manage these resources on behalf the people) leads to the most appropriate development of mining and mineral processing activities in this country.

Since the way in which ownership rights over valuable assets are specified, exercised and enforced has a fundamental effect on the efficiency with which they will be utilised (and on the distribution of returns from their use), an examination of alternatives to Crown ownership of minerals is warranted.
Private owners of valuable assets have a powerful incentive to manage their property to greatest advantage, since any decline in the value of an asset represents a personal loss. But whereas the livelihood of individuals clearly depends on how well they utilise and manage their assets, not so much is usually at stake in the case of governments. In their case, efficiency considerations are unlikely to be the only concerns driving decisions about who will be allowed to exploit minerals, where, and when. Thus, private ownership of minerals would have the crucial advantage of bringing market-based incentives to bear on the problem of efficiently exploiting minerals (which in some cases may well involve leaving them in the ground for the time being).

Such a radical change from the status quo would also have its disadvantages, however, including posing considerable practical problems. For example, an advantage of the present system is that explorers can negotiate access to large tracts of land on a company to government (or two party) basis, because so much of the Australian land mass remains in Crown ownership. This would no longer be the case under a system of private ownership of minerals, with exploration and mining companies (particularly explorers) possibly having to negotiate with many owners, thereby incurring potentially prohibitively high negotiation costs. Mineral rights which could be disposed of independently of surface rights would exacerbate this problem.

If sub-surface rights were assigned to owners of surface rights (which would be an obvious way to institute a system of private ownership of minerals), there would be the further difficulty of the perceived inequity and arbitrariness of giving away ownership of assets of unknown value to whoever happens to own the land above.

But perhaps the greatest practical problem of moving to a system of private ownership of minerals would be managing the transition from a situation where these rights are only defined in a most general way (ie mineral deposits, wherever they occur, are owned by the Crown) to a situation where a regime akin to the Torrens system of land ownership may have to be established from scratch - a daunting task.

Thus, an examination of the issue of Crown ownership suggests that systems involving private ownership of minerals would enjoy certain advantages (eg in resolving land-use conflicts) but would also entail disadvantages (eg perceived inequities in transferring assets or unknown value into private hands). While the Commission accepts that a general departure from Crown ownership of minerals is not justified at present, there is nevertheless considerable scope for improving current systems of allocating and charging for mineral rights in Australia.

What are the problems of mining on Aboriginal land?

It is common for prospective mining projects to be located in remote areas of Australia, sometimes in close proximity to Aboriginal communities and often on Aboriginal land, for example that granted under the Aboriginal Land Rights (Northern Territory) Act 1976. (Under this Act, property rights to minerals remained with the Crown, but title to land - in the form of inalienable freehold - is vested in Land Trusts on behalf of groups of Aborigines entitled by tradition to use or occupy the relevant land.)

Aborigines are generally not opposed to exploration and mining per se. But they are opposed to not being able to control what happens on and to their land (or what they regard as their land). The issue of Aboriginal land rights and their interaction with others wishing to exercise mineral rights over the same land raises complex moral and social questions. What is clear, however, is that existing mechanisms for resolving conflicts over use of Aboriginal land are unsatisfactory,
particularly in the Northern Territory where the mining industry and potentially affected Aboriginal communities are both dissatisfied with current arrangements.

**Situation in the Northern Territory**

The granting of land rights and the concurrent power to deny access to such land (considered by many to be necessary to maintain the integrity of those rights) provides traditional Aboriginal owners in the Northern Territory with what effectively amounts to de facto control over any minerals associated with their land.

The Commission accepts that Aborigines should have a right to veto mineral developments on their land subject only to the normal exercise of the national interest powers of the Commonwealth Parliament. It also notes that these are views shared by those who have been specifically commissioned to examine this issue - for example Justice Woodward who maintained that "to deny Aboriginals the right to prevent mining is to deny the reality of their land rights."

Granting land rights to Aborigines may well have restricted exploration and mining in the Territory, relative to levels which would otherwise have occurred. Nevertheless, it would be wrong to conclude from this that, as a consequence, land and sub-surface resources are not being devoted to their socially optimal use. However, current arrangements for distributing royalties (strictly speaking royalty equivalents) from mining to Aborigines in the Territory reduce the incentives for any one group of traditional Aboriginal owners to agree to exploration/mining on their land. This situation represents an impediment to the efficient development of mining and mineral processing in the Territory. The efficiency objective would be more effectively served if the share of royalty equivalents received by traditional owners were to be increased. In the Commission's view, the share of royalty equivalents currently earmarked for the administration of Land Councils should be paid to the Aborigines on whose land mines are established. This would increase their share of royalty equivalents from 30 to 70 per cent and the Commission is confident that this would go a long way towards providing more appropriate incentives for traditional owners to make the 'best' decisions from their own and the nation's point of view.

The Commission can see no reason why the ability of Land Councils to fulfil their statutory obligations - such as identifying who the traditional owners of particular tracts of Aboriginal land are, and assisting in land claims - should depend on the level of royalty equivalents (which in turn reflect the level of royalties paid by mining companies in the Territory). Land Councils - as statutory bodies with functions and responsibilities conferred under Commonwealth legislation - should be funded from the Commonwealth Budget.

In contrast to existing arrangements whereby Land Councils are the only bodies able to negotiate exploration and mining agreements on their behalf, the Commission believes that traditional Aboriginal owners should be free to negotiate agreements directly with exploration/mining companies and to conclude deals on all aspects of exploration and mining on Aboriginal land (including conditions under which exploration can be expected to lead to mining and royalties additional to those that will accrue to the Crown if mining occurs). Further, in undertaking such negotiations Aboriginal groups should be free to appoint any agent they wish to negotiate on their behalf (including Land Councils if they so wish).
Finally, the Commission considers that the Northern Territory and Commonwealth Governments should investigate transferral of mineral rights on Aboriginal land to the traditional owners. The Commission sees granting traditional owners *de jure* rights to any minerals found on their land as a possible solution to a great many of the problems currently being experienced as a direct result of ill-defined property rights.

**Situation in the States**

Aborigines generally have a special relationship with the land and strongly desire to control access to their traditional lands. Lack of such control in some States, combined with the absence of a suitable framework for miners and Aborigines to use in their negotiations, appears to be causing unnecessary and lengthy delays (e.g., before companies know whether they will be permitted access to certain areas). There was a strong desire on the part of most inquiry participants to have the ground rules clearly established (e.g., via adoption of transparent negotiation processes).

**Are the rights of other private landholders sufficiently recognised?**

Like Aboriginal land, conflicts between miners and others exercising surface rights (e.g., rural and urban landholders) reflect problems with the way property rights to land and minerals are specified.

Mining, rural and urban interests have all argued during the course of this inquiry that existing legislation is inadequate and does not therefore allow for best use to be made of both mineral and surface resources (e.g., agricultural land). Miners complain about powers of veto sometimes given to certain classes of landowners; farmers complain that explorers/miners have ridden rough-shod over rural properties; while some urban landholders have complained about the effects of mine subsidence.

Under common law, private landowners generally have the right to use their land as they see fit. These rights are attenuated, however, where others wish to explore or mine on that land. Finally, property rights to minerals rest with the Crown. It is no wonder that this combination of property rights leads to conflict among the parties, and inefficient use of society's scarce natural resources is a likely outcome.

The Commission concludes that there is a good case for reviewing existing legislative arrangements covering the rights of landholders affected by explorers/miners wishing to exercise mineral rights, where this has not already been done (or done inadequately). Important issues to be resolved by such a review include the circumstances in which compensation would be payable and formal access arrangements (including codes of conduct). The arrangements now operating in New South Wales would seem to provide a useful model for other States/Territories to consider.

**Are existing processes for handling land-use conflicts adequate?**

Competition for the right to put land to any particular use is intensifying. Typical of the conflicts over land use which are becoming more common are situations where explorers/miners and
conservationists covet the same piece of Crown land - each for different reasons. Thus where a geologist sees interesting surface expressions whose exploration and evaluation could lead to discovery of a valuable mineral deposit, the ecologist sees a rugged outcrop forming the focus of a unique ecosystem worthy of preservation - perhaps as a national park (and therefore safe from incursions by the mining industry).

Existing mechanisms for resolving land-use conflicts have proved inadequate, as the Coronation Hill/Kakadu Conservation Zone experience amply demonstrates - at considerable cost to all those with a stake in the outcome.

A basic problem is that present processes for resolving conflicts do not allow sufficiently for an objective balancing of costs and benefits of conservation/development. This can mean that both conservationists and developers are able to achieve land-use decisions favourable to them, without necessarily having to bear the costs.

Another problem is lack of certainty as to what processes will be followed in coming to such decisions. For example, the interaction between mining and other relevant State/Territory (and even Commonwealth) legislation (eg environmental and planning laws) is characterised by duplication and lack of co-ordination. This results in inefficient and drawn-out approval procedures which impose substantial costs, delays, and uncertainty on the viability of mining/mineral processing projects.

One approach to resolving land-use conflicts is to rely as much as possible on market forces to ensure that surface and sub-surface resources are put to their most valuable use. The crucial advantage of a market approach based on private property rights to land is that it would help ensure that individuals take proper account of any costs their activities may impose on others (because they will be held responsible). Thus much better outcomes could well be achieved if, for example, conservation groups actually owned (and were therefore legally responsible for) areas set aside primarily for conservation purposes, so that it was up to them to manage these areas (including deciding whether or not mineral rights could be exercised on any part of the land). An arguably more equitable variant of this 'property rights' approach would be to auction both surface and subsurface rights to Crown land, with those wishing to preserve the land for purposes other than exploration and possible mining being free to bid.

Market-based approaches need not be confined to allocating or auctioning full property rights to an area; instead ex ante or ex post charges can be levied in return for the right to put land to a particular use and to take into account possible costs imposed on others. If a potential miner faces the full costs to society of mining in a particular area - which may include, for example, posting an up-front bond to guarantee that the mine will be adequately rehabilitated after mining, and possibly also a performance bond (which will be forfeited if the way the mine is operated causes unacceptable damage to the environment) - mining will only proceed if it represents the most valuable use to society as a whole of the particular piece of land (rather than the most valuable use from the miner's point of view).

In the Commission's view, possibilities for employing market incentives should be pursued wherever feasible, in preference to reliance on governments to resolve land-use and related conflicts. The Commission believes that there is considerable scope for increased use of market-based mechanisms for resolving many resource-use conflicts (which can obviate the need to invoke
what usually turn out to be expensive public decision-making processes, particularly in contentious cases). However, in some cases market solutions may not prove feasible.

Where market approaches are not considered feasible, there may be a need for government intervention in land-use decisions (eg where Crown land is involved). There is an urgent need to base such decisions on a careful reckoning of the costs and benefits of alternative uses of public land, to ensure the community derives the maximum benefit it can from natural resources owned and controlled on its behalf by governments. It should be borne in mind, however, that ascertaining benefits and costs itself involves costs (eg having to undertake cost-benefit analyses of various options). Even modest progress down the path of making more rational (and transparent) decisions about land use would represent a marked improvement over existing decision-making processes, which are often *ad hoc* and prone to acts of political expediency.

In the Commission's view, government-imposed mechanisms for resolving land-use conflicts should:

- allow for relevant costs and benefits to be first determined, then weighed;
- promote certainty through well-defined rules and decision-making processes; and
- assess costs and benefits in a way open to scrutiny by those affected by such decisions (transparency).

In many cases, land-use conflicts only arise when someone proposes that Crown land be put to a particular use (eg that a mine be established in a particular area). The Commission recommends that approval processes be streamlined by having one government agency responsible and accountable for processing a mining application within set time limits.

Because influence over land-use decisions transgresses jurisdictional boundaries, comprehensive reform will require intergovernmental co-operation. The Commission recommends that a number of matters currently impeding efficient use of the nation's natural resources and which involve different levels of government - such as conflicts arising from the use of Commonwealth power over the States on environmental and land management issues (eg World Heritage listings) - be addressed in suitable forums, such as the Special Premiers' Conference.

If powers of discretion over the granting of mining applications are retained, the grounds on which refusals can be made should be prescribed in legislation and written advice stating reasons for a rejection should be required.

**Should exploration be permitted in national parks?**

In the Commission's view, the differing costs and benefits of exploration and mining should be recognised when it comes to imposing restrictions on access to national parks. Exploration, as primarily an information-gathering activity, should generally be permitted (subject to appropriate guidelines - which would depend, *inter alia*, on the fragility of the area in question). The real issue is whether the benefits flowing from exploring in national parks (in terms of information gained) are likely to outweigh likely costs (including possible damage to the environment).
Existing national parks have sometimes been declared without any assessment having been made of the area's mineral potential and without a convincing case being made that the entire area must remain immune from other potential land uses (such as mining). In the Commission's view, existing and proposed national parks should be subject to assessment of relative costs and benefits of such a declaration. (This will generally mean permitting exploration and evaluations of other potential land uses.) Objective assessment of relative values of alternative land uses to society could also entail, in the case of national parks and similar areas, distinguishing between core ecological areas and buffer zones, and between different types of activities (eg exploration versus mining). Governments in Australia should consider adopting the South Australian regional reserve concept as a way of distinguishing between core ecological areas and areas of lesser fragility or importance.

**Are National Estate and World Heritage listing processes in need of rethinking?**

Places (including areas of land which may be highly prospective) which have aesthetic, historic, scientific or social significance may be listed on the National Estate or, if of sufficient international significance, may gain a World Heritage listing. Because they can effectively preclude other uses, such listings can be irrational from society's point of view - particularly if they mean that land is not put to its most valuable use. This can happen in the case of National Estate and World Heritage listings because economic considerations may play no role in the assessment process, nor may the issue of compensation arise when the property rights of others are infringed.

Because the very name connotes places which sound as if they should be preserved at any cost, National Estate listings can frustrate rational assessment of the likely costs and benefits of alternative uses of land. To combat misunderstandings and misrepresentations of their nature and significance in the eyes of the public, the Commonwealth should consider renaming the Register of National Estate Places (eg as the Australian Register of Places of Interest). Failing this, there is a strong case for removing land of 'nature' value from the purview of the Australian Heritage Commission, on grounds that such areas can be adequately protected by other existing mechanisms (eg national park declarations).

Similarly, while protecting places of world significance is laudable, present listing procedures do not adequately allow for the values of alternative land uses to be taken into account. There is a strong case for changing the procedures applying to Australian nominations for World Heritage listings, with the aim of ensuring that the values of alternative land uses are adequately taken into account. Important in this regard is public input into some form of evaluation (eg Resource Assessment Commission inquiry), the payment of compensation (by the Commonwealth Government as the proposer of the nomination) to individuals/companies or State/Territory governments suffering demonstrable loss as a result of a listing proceeding, and a requirement that nominations be accompanied by a draft management plan to provide more certainty to affected landholders. Such reform would clearly require co-operation between State/Territory and Commonwealth governments. Agreement on procedures to be followed in respect of World Heritage listings need to be resolved by negotiation between governments in Australia.
Allocation of mineral rights

Rights to explore for minerals and to mine resulting economic discoveries are normally allocated on a first come first served basis in Australia, usually with conditions attached (eg that a proportion of each exploration lease must be relinquished at regular intervals if nothing is found).

Rights to explore for and develop mineral deposits are potentially valuable assets, for example in cases where a modest exploration effort results in the discovery of a world-class orebody. Of course, mineral rights may also (and in most cases do) prove worthless (eg because nothing is found - an outcome made more likely in the case of existing exploration licences because of the limited duration of such rights).

The inherent uncertainty about the value attaching to exploration and (to a lesser extent) mining rights poses something of a dilemma for governments (in their role as agents for society at large). On the one hand, being granted the exclusive right to benefit from any minerals found in a particular area is a potentially valuable right - the more so if relatively few resources have to be devoted to exploration to discover and delineate a high-grade orebody. In these circumstances, society (as the owner) will expect appropriate compensation in return for transferring the right to exploit its assets to others, particularly if what are seen to be windfall gains will otherwise accrue to the transferee. On the other hand, mineral deposits are clearly not so valuable when relatively high exploration costs have to be incurred in order to find a deposit - costs which should properly be offset against any potential surplus arising from the mining phase. The remaining possibility is that no economic deposit is discovered - leaving the explorer out of pocket.

Clearly, the way mineral rights are allocated and the mechanisms governments set up to `charge' for those rights (which is the role of royalties) will have a considerable influence on the efficiency and competitiveness of mining and mineral processing activities in Australia. If the principal method of allocating mineral rights limits their duration, then overexploration and premature exploitation of minerals is a likely outcome, as mining companies seek to be first to discover economic mineral deposits (in the same way that a fishery open to all can soon be fished out). At the other extreme, if society overcharges for mineral rights, efficiency will be impaired and the mining and mineral processing sector will not contribute as much as it could to wealth creation (thereby depressing Australian material living standards below their potential). Striking the right balance is what is called for, but achieving such a balance is another matter.

What type of mineral rights should governments confer?

The nature of rights granted by governments to minerals plays an important role in shaping the overall structure of incentives facing explorers/miners. Key aspects of mineral rights which fundamentally affect decisions made about how miners will go about their activities include:

- the nature of any conditions attaching to them;
• the security with which they are held;
• the length of tenure of the rights; and
• their tradeability.

Each of these aspects can affect resource-use decisions, and therefore the efficiency with which Australia's mineral resources are discovered and developed (and the value received by Australian society in consequence).

In order for the community to reap maximum benefit from publicly owned mineral resources, it is of fundamental importance that mineral rights be allocated in such manner and subject to such conditions as permit those with the best information and expertise to acquire and exercise those rights. Ideally, the system should confer rights over minerals which provide incentives for miners to behave as if they owned the deposits they seek to discover and develop, unencumbered by conditions which effectively dictate how or when such resources, once discovered, should be mined. (Of course, no property right is completely unconditional, but unless exercising rights over one's property interferes with the rights of others - for example the rights of landholders who make their living from exercising surface rights which may be devalued by mining, or the right of the community to a habitable environment - mineral rights should be encumbered by as few conditions as possible.)

More secure and less restrictive mineral rights would be much more valuable to those to whom such rights are transferred than is the case with existing exploration and mining rights. And more valuable rights from the point of view of the transferee would be more conducive to the community receiving an appropriate return for allowing others to exploit what are publicly owned non-renewable natural assets (because holders of such valuable rights will acknowledge their worth by striving to exercise them in the most efficient manner possible).

The Commission favours the allocation of long-tenure, freely tradeable mineral rights subject only to limited and well-defined conditions, because they would provide the most appropriate incentives for the efficient conduct of exploration and mining (and thus the maximisation of Australians' collective mineral wealth).

**How should these rights be allocated?**

The method by which mineral rights are transferred from public to private hands can have both efficiency and equity implications, with the latter depending importantly on the type of property right being allocated. When viewed from these twin perspectives, the most appropriate method of allocating the relatively unconditional mineral rights advocated by the Commission may well differ from that for allocating existing, more restrictive exploration/mining rights. The question is: Which combination of mineral property right and allocation mechanism is most likely to promote the maximisation of the value of Australia's mineral wealth, bearing in mind that the allocation mechanism should be capable of appropriating a 'fair' return for the community in their capacity as owners of that wealth?
The Commission considers that long-term (eg 99 year), tradeable mineral rights subject only to limited and well-defined conditions be allocated by competitive cash bidding - alone or in combination with a pre-announced royalty regime. The Commission envisages that such an auction would be triggered automatically whenever a formal application is made for an exploration licence over a particular area. The name of the applicant should not be made public and the auction should be run on the basis of sealed bids. The successful bid should also be made deductible against any future liability to pay royalties where mineral rights are auctioned subject to a pre-announced royalty regime to apply should a mine (or mines) eventuate during the term of the mineral rights conferred.

How does sovereign risk affect the mining industry?

Sovereign risk (the term used to refer to governments changing the rules mid-project, thus eroding the value of private property rights) is a grave problem facing the mining industry in Australia. Sovereign risk represents a serious impediment to the efficient development of mining and mineral processing industries in this country, and one which diminishes the value of the mineral estate owned collectively by all Australians. This has been made abundantly clear during the course of this inquiry. Particular areas where sovereign risk looms large are government-induced uncertainties about the likelihood of being able to convert a right to explore into a right to mine, and unexpected changes in royalty arrangements midway through a mining project.

In respect of the transfer of mineral rights to private hands, governments in Australia should arrange the charging systems for allocating such rights (eg by adopting that combination of a cash bidding and pre-announced royalty system which best suits the position they wish to adopt as regards risk), so that they (or future administrations) will not be tempted to intervene subsequently to change the rules.

Can existing systems be improved?

If governments are not prepared to offer potentially valuable mineral rights of the kind favoured by the Commission, preferring to stick with the more limited mineral rights associated with the status quo, the Commission agrees that:

- `first come first served' allocation systems are appropriate where there are poor prospects of significant competition to acquire those rights (eg because there is little prior information about the prospectivity of an area);
- existing relinquishment provisions and the requirement for full revelation of exploration results should be retained; but believes that
- exploration permits should not be subject to any conditions relating to work which must be carried out.

In situations where it is anticipated that there will be competition to acquire mineral rights (eg in the case of mining leases over areas known to contain coal) auctioning such rights should be preferred to other mechanisms that have sometimes been used (eg work program bidding). Work program bidding is demonstrably inferior as a method of allocating exploration rights and is likely to result in significant inefficiencies.
Royalties

A significant cost faced by miners can be having to pay royalties. Mineral royalties in Australia have tended to be levied on a physical or (gross) value basis based on mine outputs. Specific-rate royalties are levied on the volume of output (e.g., a certain dollar amount per tonne of ore despatched), while *ad valorem* royalties are levied as a percentage of the value of output (suitably defined). Profit-based royalties - although still relatively rare - are becoming more common.

In the Commission's view the economic efficiency yardstick should assume the greatest importance when it comes to evaluating royalty regimes, because it encourages the biggest mineral cake to be produced (which can then be shared among those responsible for producing it - including the community as owners of minerals). In practice, other considerations (such as administrative costs and effects on revenue stability) may force some trade-off, so that efficiency gains may have to be sacrificed to some degree.

What are royalties and are such charges justified?

Royalties are payments to owners of minerals for the right to exploit them. They should not be regarded as a tax (even though some types of royalties are often referred to as taxes - for example, resource rent taxes). Correctly interpreted, royalties are not an unwarranted impost on miners, but are a charge analogous to payments for access to other "gifts of nature" - such as broadcasting licence fees for the right to use part of the electromagnetic spectrum or payments for fishing quotas which represent a right to take a certain quantity of fish from a fishery.

The people of Australia (as owners) are entitled to be appropriately compensated in return for transferring the right to exploit the country's mineral wealth to mining companies. The real issue is whether existing royalty arrangements accomplish this objective or whether not only do they fail to secure an appropriate return for the community at large but, in the process, they compromise the efficiency objective (with the result that the Australian people get the wrong-sized slice of what is in effect a diminished mineral cake).

Are current royalty regimes efficient?

The value of mineral rights in any period (referred to by economists as economic rent, or in this context as mineral rent) is the difference between the revenue that can be earned from selling mine outputs and the opportunity cost of inputs used in their production. Importantly, opportunity costs are defined as minimum outlays necessary to attract required inputs (e.g., labour and capital) to mine a particular mineral deposit, rather than have those resources engaged in some other activity. Apart from exploration costs incurred in discovering and delineating the deposit, these costs therefore also include a 'normal' return on capital employed in the mining operation.

Royalties based on mineral rents (if any) would enjoy advantages over existing arrangements. By relating the cost of transferring mineral rights to any available mineral rents, pure-rent royalties (in contrast to other royalty schemes, for example the Resource Rent Tax applying to petroleum) represent efficient forms of transferring ownership, since they do not distort production decisions. A pure-rent royalty is a charge on the net cash flow of a mining project in which the government shares to the extent of the tax rate in both positive and negative outcomes.
Output-based royalties suffer from a number of drawbacks. First, they lead to inefficient decisions being made about the rate at which to mine ore and also the cut-off grade below which it is uneconomic to continue mining. Second, since royalty payments do not vary with the profitability of a project, already variable returns from a risky activity may be made even more so. Third, in cases where royalty payments are perceived to be inadequate in relation to available rents (eg because of some unanticipated event which has increased their worth), governments are likely to impose additional imposts - such as excessive charges for publicly provided services, insisting that additional infrastructure be provided by the mining company and/or introducing new charges (eg export duties). Finally, in periods when (annualised) rents are low or non-existent - such as during economic downturns - high administrative and lobbying costs may have to be incurred to get royalty charges reviewed. The fact that royalty payments may be negotiable in certain circumstances also contributes to uncertainty.

What royalty system does the Commission recommend?

The Commission recommends adoption of a pure-rent royalty system for other than low unit value minerals, incorporating an up-front cash bid component to be collected when the long-tenure, freely tradeable mineral rights of the type advocated by the Commission are auctioned.

This means that governments need to take a position on how 'risky' they wish their mineral portfolio to be. For example, a totally risk-averse government would sell the mineral rights outright at auction to the highest bidder, thereby taking no risks as to whether or not minerals will ever be found in a given area - let alone that they will generate mineral rents in which the government would be entitled to share as a reward for assuming at least some of the risk. At the other extreme, governments which feel they can afford to gamble on realising the occasional very large return from a world-class deposit may wish to opt to appropriate a large proportion of any mineral rent via a pure-rent royalty, while accepting that this will mean very small bids up front, and the prospect of having to bear their share of negative rents when, for example, exploration fails to find a viable mineral deposit. A compromise might see, for example, the relevant government pre-announcing (say) a 40 per cent pure-rent royalty to apply \textit{ex post}, with the balance being collected \textit{ex ante} in the form of the winning bid for the mineral rights to an area.

Most importantly, governments would have to realise and accept that the rules of the game are such that they cannot change their minds halfway down the track and cream off, for example, extra rents from the occasional 'bonanza'. Indulging in this type of behaviour (ie increasing sovereign risk) will merely serve to encourage explorers/miners to engage in appropriate offsetting strategic behaviour (which may take the form, for example, of taking their knowledge and expertise to some other country where the rules are more settled, or reducing the size of up-front bids they are willing to make). One way or another, the result of heightening perceptions of sovereign risk on the part of prospective miners will be to dissipate potentially available mineral rents - to the disadvantage of all Australians.
Although rent-based royalties may be more costly to administer than existing arrangements, efficiency gains could be expected to outweigh these additional costs, except in the case of minerals with low net unit value - such as construction materials and non-metallic minerals (but not coal). There is no compelling case to change existing royalty arrangements for these minerals.

If a pure-rent royalty regime is adopted, existing projects should, within a short period of its coming into force, have a once-only option of changing to it. Further, projects which change over to such a rent-based regime need to be given credit for capital investment not yet recouped. This could be done by allowing a deduction equal to the written down value of capital (eg as taken from taxation records) in the first period of calculation of cash flow.

An important aspect of the way mineral rights are charged for concerns differences between ex ante and ex post systems (ie whether governments collect money up front - as would be the case with auctions - or wait until mine outputs are produced before charges are imposed - as is the case with many existing royalty arrangements). A significant potential problem with ex post charging mechanisms (particularly rent-based ones) is that, by the time everyone has fought for their share of the revenue dollar (including any rents properly attributable to the mineral deposit itself), nothing remains with which to recompense society for transferring to others the right to exploit its mineral assets. Many of the recommendations contained in this report are aimed at encouraging such rents to emerge, so that an appropriate return to the community for the exploitation of public resources can be secured by government.

**How can current royalty regimes be improved?**

In recent times, some governments have introduced royalty arrangements (eg profit-based ones) which vary more closely with a project's capacity to pay. Placing less reliance on output-based royalties and more on profit-based ones is a development which is at least moving in the right direction. However, the Commission considers that recent moves to adopt royalty systems which incorporate a profit-based element should be taken to their logical conclusion of charging rent-based royalties, to apply to metallic minerals and coal. This recommendation should not, however, apply to low unit value commodities (such as limestone and construction materials). For such commodities, rents (if they exist at all) are likely to be insignificant and increased administration costs compared with existing arrangements would likely outweigh any efficiency gains from changing royalty arrangements.

**How should governments treat royalty receipts?**

Royalty payments by mining companies are often incorrectly seen as revenues which can be used to finance government current consumption expenditures. Instead, they should be regarded as a capital transfer from minerals in situ to cash in a Mineral Resource Capital account. This is most obvious in the case of, say, the phosphate deposits on Nauru. Here, as mining of the island's most valuable asset progressed, the flow of revenues was reinvested on behalf of the inhabitants in other assets with the intention of providing a flow of income in perpetuity (rather than ceasing when the deposits were mined out). Australia's mineral capital is a depleting asset as mines are established. Accordingly, royalties from mining should be accumulated in a capital account and used to retire
public debt or to create capital assets of commensurate value. Such an approach is in keeping with the idea of sustainable development. Otherwise, Australian governments will be living off the peoples' capital and spending excessively for recurrent purposes. Treatment of royalty income in the national accounts should be consistent with such revenues representing capital transfers, rather than being treated as current income.

**Taxation**

Like most other industries, mining and minerals processing activities are subject to a wide range of direct and indirect taxes. Some taxes disadvantage mining or minerals processing, while others advantage them relative to other economic activities. If such distortions could be corrected, more appropriate investment decisions would be made both within the mining and early-stage minerals processing sector and elsewhere.

Examples of taxation arrangements which disadvantage mining are tariffs on imported equipment, limited deductibility for exploration, rehabilitation, and plant demolition expenditures, no deductibility for expenditure on housing and welfare facilities not located near the minesite, and discriminatory local government rates calculated on the basis of mine outputs. Some of these problems were addressed in the 1990-91 federal budget.

The Commission considers that the definition of eligible exploration expenditure in Section 122J of the *Income Tax Assessment Act 1936* should be broadened beyond the existing 'on tenement' definition to include all properly attributable exploration expenditure, including modern approaches such as remote sensing and 'desktop' research. Also some types of feasibility expenditure (such as assaying) are, in principle, exploration expenditure and should also qualify as an eligible deduction under Section 122J.

The Commission supports recent moves to allow minesite rehabilitation expenses (including demolition of old plant) to be tax deductible, but considers that the provisions should allow 'carry-back' of these expenses if insufficient income is available for a deduction in the year the expense is incurred. Additionally, expenditure on housing and welfare facilities should be deductible if located in areas where Zone Rebates apply for the purpose of calculating income tax liability.

The Commission also considers that the cost of Environmental Impact Statements should be capitalised and depreciated over the life of successful projects.

Local government rates based on the value of output are a poorly disguised resource tax. Other land users are usually charged on the basis of the unimproved (or rental) value of their land - which means that the treatment of mining is discriminatory. Removal of such discriminatory arrangements may be more palatable, however, if it is linked to more satisfactory intergovernmental financial relations and infrastructure financing policies, because some local governments are coming to rely increasingly on rates from mining companies to alleviate their financial problems.
An example of taxation arrangements which advantage mining is the 50 per cent concession for Fringe Benefit Tax on company-provided subsidised housing and travel to remote areas. Although the introduction of this tax impacted on mining activities in remote areas more heavily than on other activities, in the Commission's opinion this does not justify different treatment for the purpose of this particular tax. The problems of attracting labour to remote areas is best handled in more direct and transparent ways - such as increasing Zone Rebates for income tax purposes or decentralisation grants to apply to all remote area economic activity. Accordingly, mining companies (and other employers in remote areas) should be subject to full Fringe Benefits Tax liability, but equivalent offsetting changes in Zone Rebates should be implemented, in recognition of the purpose the concession is meant to serve.

The ability to deduct capital expenditure over ten years (under Division 10 of the *Income Tax Assessment Act 1936*) or 20 years (under Division 10AAA) may be concessional to mining activities in some cases.

Other taxation arrangements for which it is not clear whether the arrangements detract from efficient mining investment decisions are the transitional taxation arrangements for gold and capital gains tax on farm-outs.

While the Commission acknowledges the high tax burden prevailing in Australia relative to some of our competitors, it does not believe Australia should attempt to match concessions offered by others.

**Environmental concerns**

Society derives significant monetary benefits from mining and mineral processing activities. However like all human activities, exploration, mining and minerals processing can damage the natural environment and the resulting implied costs have often not been taken into account in determining the extent of net social benefits attributable to these activities. For example, abandoned minesites have sometimes had to be rehabilitated at public expense. Like other activities, mining and minerals processing can also involve other costs which are sometimes not factored into private assessments of the viability of development projects, including such things as forgone benefits to others of unpolluted water, clean air, unspoiled views and biological diversity.

Thus, numerous problems arise from the unavoidable interaction between mining and mineral processing and the natural environment - a situation which is, of course, not unique to these activities. Indeed, mining companies (particularly the larger ones) are already under significant pressure to behave as good corporate citizens, and many have taken steps to ameliorate the adverse environmental effects of their activities.

Nevertheless, threats to the environment attributable to mining and mineral processing are real enough, and the costs of ensuring that adverse environmental effects are acceptably contained are costs properly attributable to these activities. The issue is not so much who should pay to ensure that any damage to the environment is kept within acceptable limits (most miners accept that they should bear pollution abatement and minesite rehabilitation costs), but how to satisfy environmental objectives while maximising net benefits from mining and further processing of
minerals. It all boils down to the structure of incentives facing those posing a threat to the environment.

Groups with a special interest in environmental protection have tended to be wary of markets (and therefore market-based solutions to environmental problems), on the grounds that some 'market' outcomes have clearly damaged the environment, in some cases irreparably. At the same time, some proponents of economic growth have seen environmental concerns as unnecessarily obstructing projects which have the potential to raise material living standards (particularly their own). Conflict and confrontation have been the inevitable result of the clash of strongly held views.

But the climate seems to be changing. Growth advocates have increasingly come to accept that projects that only serve to enhance wealth in the short run but which damage the environment (possibly permanently) are ultimately counterproductive. On the other side, sections of the environmental movement are increasingly acknowledging the potential for harnessing market forces in their cause (eg by bidding for mineral rights in order to prevent them from being exercised), while also acknowledging that declining living standards would only serve to undermine our ability to protect the environment.

Concepts such as multiple/sequential land use and sustainable development are being increasingly discussed and polarised growth/no growth debates may give way to choices among alternative development paths, with wider connotations being given to what is meant by economic growth and its relationship to the quality of life.

Clearly, exploration (but more so mining) can harm the environment, with the extent of possible damage varying greatly depending on the nature of exploration/mining activity and the fragility of the area being explored/mined. However, this does not in itself justify banning exploration (or mining) in certain areas. The real issue is whether the benefits flowing from these activities (eg in terms of information gained in the case of exploration) outweigh the likely costs (including potential damage to the environment). Other than in exceptional circumstances, the Commission considers that there are likely to be net benefits from allowing exploration.

While the evidence is somewhat mixed, the Commission's view is that there is no reason why modern rehabilitation techniques should not prove to be generally successful, if success is understood to be reasonable compatibility of the former minesite with the surrounding area. In any event, it may make more sense to aim for compatibility with a range of other uses for post-mining land, after taking into account the costs and benefits of attempting to rehabilitate land to something close to its original state. In fact, in areas of marginal conservation value it may be much more sensible, for example, to prepare the site for ongoing agricultural or commercial development, or to undertake only minimal rehabilitation.

What should be done to ensure that the potentially adverse environmental effects of mining are kept within acceptable limits?

The Commission considers that, wherever feasible, the most efficient response to the problem is to harness market forces to protect the environment. Instead of mandating prescribed actions, such as requiring that companies install particular pollution control equipment (which has typified the regulatory 'command-and-control' regimes that have hitherto predominated), this approach seeks to
achieve environmental objectives by changing the economic incentives facing those whose actions have the potential to harm the environment.

This can be accomplished, for example, via fees or charges (ie by invoking the polluter- or user-pays principles), use of market-based instruments such as transferable pollution permits (to contain overall damage to an pre-specified level), requiring the posting of rehabilitation bonds to ensure clean-up after mining ceases and/or performance bonds (the size of which depends on the potential for environmental damage and which are refunded - with interest - contingent on satisfactory compliance with pre-specified performance), or by holding companies legally liable for any damage they cause (to the environment or others). What method would work best, however, depends on the particular mining and/or mineral processing operation and the threats posed to the surrounding environment, so that it is difficult to proceed beyond in principle recommendations.

The Commission recommends that mining companies be required to post rehabilitation bonds (or equivalent financial instruments) sufficient to cover the estimated costs of appropriate minesite rehabilitation. Further, governments could consider requiring the posting of 'performance' bonds in cases where it is judged that a demonstrable threat exists that a mining project could cause 'catastrophic' environmental damage, with such bonds being automatically forfeited if such damage should occur.

In the Commission's view, many mining-related environmental problems occur because of ill-defined property rights and obligations which are either unenforced or unenforceable. However, not all problems will necessarily be solved even if property rights are better defined, because of the presence of externalities not amenable to the exclusive assignment of rights - as well as the 'public good' nature of some environmental services. Nevertheless, the Commission is of the view that, if governments intervene to correct for market failures, market-oriented mechanisms based on enforcing or defining property rights (eg effluent charges or tradeable pollution permits) should be generally preferred to 'command-and-control' approaches.

**Are mining and sustainable development incompatible?**

There is growing support for the concept of sustainable development. Yet the concept remains fuzzy and seemingly capable of condoning all sorts of policies and actions.

The effect of mining and mineral processing activities on mineral sustainability per se seems to be of little immediate importance. In this respect, efficient decision-making about when and at what rate to exploit known mineral resources (which it is one of the objectives of this report to encourage) will lead to sustainable development of the industry.

Rather, the issue is not so much whether mineral production can be sustained, but how to manage mining and mineral processing activities in such a way that they do not threaten the sustainability of the natural environment.

There was no evidence presented to the Commission that modern mining practices are inconsistent with sustainable development (including ecologically sustainable development).
Can existing environmental impact assessment processes be improved?

Environmental impact assessment as currently practised in Australia has many problems. Questions have been raised about the scope, content and scientific integrity of many environmental impact statements prepared in support of mining and mineral processing (and other development) projects, as well as whether a project-by-project approach is desirable. Concerns have also been expressed about limited opportunities for public participation in the process, and the potential for the whole process to become hostage to political expediency.

The Commission considers that where more market-based incentives cannot be used to ensure acceptable environmental outcomes without the need to conduct some form of environmental impact analysis, such assessments should be primarily be restricted to scientific studies which (as the name implies) address the likely environmental consequences of a project. They should also include a consideration of the implications of measures the proponent proposes to take to lessen or minimise the likelihood of environmental damage.

Indeed, some form of environmental impact assessment may well be needed to set the parameters of market-based approaches (eg the sizes of performance bonds). Nevertheless, the Commission is far from convinced that the act of undertaking environmental impact analyses of proposed mining development projects is preferable to enlisting other mechanisms (eg market-based ones such as pollution taxes or forfeiture of bonds) which may be able to achieve desired environmental outcomes at less cost.

If there are other claims on the land in question (eg involving some public use of it), such studies could also inform a wider consideration of the likely economic costs and benefits to society of various courses of action (which may impact on other natural resources in the area), including the proponent's proposal and other potentially competing uses for the land. A full reckoning of anticipated costs and benefits is likely to be an expensive and time-consuming path to go down, and the Commission would not advocate such a full cost-benefit approach, except in rare and clearly contentious cases.

In most cases government should be able to make a decision on the acceptability of a project on the basis of the proponent's environmental impact statement, within strict time limits (unless an interested party obtains approval for an extension of time from an appropriate court).

Government regulation and institutions

Mining and minerals processing activities are subject to detailed regulation involving all levels of government (ie Commonwealth, State/Territory and local). Unfortunately, independent pursuit of their own purposes by each level of government, combined with a penchant for frequent and in many cases ad hoc changes in the rules, has resulted in a bewildering mish-mash of regulations. This imposes substantial costs, delays, and uncertainty - particularly when it comes to trying to gain approval for new mining projects - while rarely achieving apparent objectives (or doing so only at enormous cost).
Is Commonwealth intervention in mineral trade warranted?

Commonwealth Government intervention in mineral trade has the potential to significantly influence the competitiveness and efficient development of mining and mineral processing activities. Such interventions include export controls, export duties, statutory marketing arrangements, export assistance schemes, and membership of international commodity agreements.

Often these interventions are represented as attempts to gain some ‘market advantage’. However, with Australia often accounting for only a small proportion of world production of a commodity, and the likelihood that potential buyers will turn to alternative suppliers or substitute commodities, it seems increasingly implausible that any scarcity-induced price increases stemming from supply restrictions on Australia’s part could secure even short-term (let alone long-term) benefits. Moreover, our credibility in international negotiations aimed at reducing barriers to trade will be strengthened to the extent that Australia is seen not to be imposing such distortions itself.

There are also concerns that we not allow Australia’s non-renewable natural resources to be sold at less than their real worth, including fears that multinational mining companies will not act in Australia’s best interests. The problem with this type of argument is that, on the one hand, reasonable people can and will differ on what constitutes a ‘fair’ price at any point, while on the other there is no way that buyers can be compelled to pay any particular price (even if agreement can be reached on what would constitute a ‘fair’ price) if other potential suppliers are prepared to undercut it. In other words, economic realities can clash with what is hoped for in terms of a fair and equitable outcome. There are also significant costs entailed in a system which demands that contracts for the sale of minerals be cleared by governments, even if agreement is usually forthcoming.

Export controls should not be used to conserve minerals for domestic use, since they can impose costs on suppliers in terms of having to forgo possibly more profitable overseas sales, as well as artificially reducing prices to domestic consumers - to the detriment of efficient resource allocation. They also impose costs through delays in gaining necessary approvals, the uncertainty they engender for trading partners, and the resources they tie up in setting, monitoring and enforcing the regulations.

In the Commission's view, there is insufficient evidence of distorted purchasing arrangements to justify use of export controls. Existing export controls (except those in relation to the Nuclear Non-Proliferation Treaty and Australia's bilateral safeguards agreements) should be abolished.

The Commonwealth currently levies duties on the export of certain high-quality coking coal and uranium concentrate. The coal duty is inequitable and should be abolished, ideally in concert with reform of State Government royalty arrangements. The Commission also believes that the uranium export duty should be abolished, ideally in concert with the introduction of more appropriate charging arrangements for any environmental damage attributable to uranium mining.

Australian mining and minerals processing industries would lose little if existing assistance benefiting these activities (eg services provided, or schemes run by the Australian Trade Commission or State governments) were removed. But they stand to benefit a great deal if assistance presently provided to other economic activities (eg via tariffs on imports) were to be phased out.
Various non-tariff and tariff measures of protection maintained by other nations adversely affect Australia's exports of mineral products, since they penalize low-cost mineral producers attempting to build market share, interfere with the rational development of new suppliers and growth in trade, and create additional distortions and uncertainties in the international market for minerals.

The Commission supports efforts by the Commonwealth Government to reduce barriers to international trade in minerals, both bilaterally and multilaterally.

Is foreign investment regulation of mining appropriate?

Mining is subject to more restrictive foreign investment regulations than those applying to most other Australian industries. This differential treatment can lead to uncertainties, delays, and inefficient project decisions (e.g., suboptimal joint venture and financing arrangements) - as well as entailing additional administrative and compliance costs. While the Australian community is entitled to receive adequate compensation in return for allowing others to exploit publicly owned resources, the Commission does not believe that this justifies the differential foreign investment regime currently applying to mining. More appropriate measures exist (e.g., taxation and royalty policies) to protect the national interest, without having to resort to an indirect measure which has the potential to significantly impede the efficient development of the Australian mineral industry. The Commission believes there is a strong case for bringing foreign investment regulations as they apply to mining into line with those applying more generally.

Is current State/Territory regulation of mining satisfactory?

Mining Acts in each State/Territory are the major legislative vehicles for imposing conditions on mineral development. These Acts specify procedures to be followed in the exploration for and exploitation of all minerals within their particular jurisdiction. Beside State and Territory mining laws, there is usually other legislation which impinges on mining and mineral processing activities (e.g., covering planning and environmental issues - such as noise control, clean air, and other forms of pollution). Special Project Agreements legislation is also used in some States to regulate the development of particular (usually large) mining projects.

Substantial costs and inefficient allocation of resources are the inevitable outcome of this uncoordinated, inconsistent, and sometimes outdated confusion of regulation. The Commission is convinced that regulations imposed by State and Territory governments represent a major impediment to the efficient development of mining and minerals processing activities in Australia. Of particular concern is the way in which mining law interacts with other legislation (e.g., that addressing planning and environmental concerns). A general lack of co-ordination among relevant government departments, combined with a similar lack of integration in relevant legislation results in drawn out and inefficient approval procedures - which impose substantial costs, delays, and uncertainty on an industry in which time is of the essence.

Problems also exist with the State/Territory Mining Acts themselves. Lack of consistency between different jurisdictions (when there is no reason for different approaches), continued reliance on outmoded concepts, and wide scope for the exercise of ministerial or bureaucratic discretion all impose costs which could be avoided. Many provisions in these Acts also unnecessarily restrict the decision-making powers and flexibility of companies to adapt to changing conditions, thereby inducing inefficient behaviour in the industry.
While some States have addressed (or are addressing) some of these problems, there is a pressing need to make much more (and much more rapid) progress. An urgent requirement is to streamline administrative practices to speed up approval procedures, without compromising other concerns (eg about possible adverse environmental impacts). One approach would be to introduce 'one-stop shopping' whereby one group takes responsibility for progressing an approval expeditiously, with the onus on it to smooth the way with other arms of the bureaucracy. A variant of this approach (used in the United States) is to impose time limits on the approval process, with projects given an automatic go-ahead after a pre-specified time, unless someone mounts a persuasive case in an appropriate court that allowing a specified further period is essential to sound public decision making.

The Commission recommends that State/Territory governments review their Mining Acts to take account of advances in technology, to limit the scope for discretion, and to modify those provisions which currently induce inefficiency (eg expenditure conditions). Consideration should also be given to some form of co-ordinated review of Mining Acts to promote consistency between States/Territories where this would be in the interests of the nation as a whole.

Is current regulation of the coal and uranium industries justified?

As well as much general regulation applying across the board, two activities - coal and uranium - are subject to 'special' government regulation.

The coal industry is subject to particularly detailed Commonwealth and State Government intervention - some of which is unique to the industry and much of which is unparalleled in other Australian industry (eg in terms of the extent to which even day-to-day operations are monitored and regulated). As a result, government agencies oversee/regulate almost all aspects of coal-mining operations, including occupational health and safety, workers compensation arrangements, production decisions (including whether mines will be permitted to open, expand or cease operations), industrial relations, marketing, and research and development.

Many of these regulations were introduced progressively over a considerable period in response to particular circumstances or events. However, changed conditions have in most cases weakened or negated the original rationales for government intervention. In these circumstances and with the now competitive nature of international coal markets, retention of inappropriate regulations is impeding the efficiency and economic performance of the industry. The Commission is convinced that substantial gains would flow from reducing the level of government intervention in an industry that, despite the existence of severe impediments, remains Australia's largest earner of foreign exchange.

In the Commission's view, there is no justification for continuing to have any separate regulatory body overseeing the coal industry. The Commission recommends that the Joint Coal Board, the Queensland Coal Board and other such bodies be disbanded and any necessary ongoing functions allocated to other existing bodies.
The Commission also considers that there is no case for any separate industrial relations tribunal devoted to the industry. The Commission recommends that the Coal Industry Tribunals be disbanded and their functions be subsumed by the Industrial Relations Commission (or appropriate State/Territory body).

Since the coal industry is prepared to meet its own research and development needs and can capture the resulting benefits, the Commission considers there is no justification for further government intervention in the form of a research and development levy. If this levy is retained, however, research programs should be responsive to industry needs and should adhere to strict cost-benefit criteria.

The uranium industry in Australia is also subject to several government interventions which do not apply to other mining and mineral processing activities. The most important of these is the Commonwealth Government's 'three mines' policy. Although clear public statements of the rationale for continuing this policy are hard to find, debate tends to revolve around two arguments: environmental/safety concerns; and the likelihood/unlikelihood of worthwhile market opportunities emerging, based on speculation about the likely long-term balance between the supply of and demand for uranium.

Government attempts to manipulate the uranium market by artificially limiting Australian supplies - in the hope of forcing the price up - have not been successful (if indeed that was the intent).

The Commission also considers there are no persuasive reasons why other uranium mines could not operate under the strict environmental controls and safeguards which currently apply to existing Australian operations and exports.

In the Commission's view, government intervention in this industry should be limited to ensuring adequate safeguards are in place with respect to the mining, processing (including enrichment), transport and use of uranium. In particular, the development of uranium mines in Australia should be a matter for commercial decision.

The Commission further believes that governments in Australia should allow uranium to be enriched here if a normal commercial opportunity should arise, subject to appropriate environmental and other safeguards.

**Construction and operating costs**

**Who should provide necessary industrial and social infrastructure?**

Expenditure on necessary infrastructure can account for a large proportion of total project costs (particularly in the case of mines located in remote areas). Since such outlays are often incurred years before any offsetting revenues are obtained from mineral sales, it is important in terms of the viability of projects that financial responsibility for infrastructure is appropriately apportioned between the developer, governments and any other users.
Much necessary infrastructure is specific to individual mining/processing operations (or a group of projects in a particular area). The main types of infrastructure in this category are transport (e.g., railways, ports, and roads), power supply, and townships (unless a fly-in, fly-out operation is planned). There should be no obligation on governments to pay for operation-specific infrastructure - the mining company has an incentive to provide such facilities, otherwise the underlying economics of the projects are questionable.

However, there are some items of what is usually termed social infrastructure (e.g., schools, health facilities, and law enforcement) which governments ordinarily provide and which are for the benefit of the community at large. In such cases the project is penalised if it must provide such facilities (when they are provided elsewhere by governments and funded from general revenue).

Sharing of costs between the developer and governments have not always been on a strictly attributable basis. For example, State government policies have varied depending on their budgetary position, the perceived capacity of the project to pay, and the extent to which infrastructure provision has been used as a vehicle for State development or a de facto royalty. Additionally, whatever extra costs have been involved have tended to be further inflated, for example, by taxation arrangements which disallow a deduction for expenditure on housing and welfare facilities not located near the minesite, and by governments insisting on owning, controlling and even subsequently charging for facilities originally paid for by the developer.

**How efficient are transport services required by mineral producers?**

Because of the large distances between many Australian mineral deposits and the markets in which ore (or processed products) are sold, transport costs loom large as important determinants of the competitiveness of our mining and minerals processing industries. Yet excessive costs and charges often characterise Australian transport services compared with what an economically efficient system could deliver. Further, charges for transport services are sometimes higher than what are already inefficient costs of supply (e.g., some publicly supplied rail services) - further undermining the international competitiveness of goods which are transport intensive.

Rail and coastal shipping are the two domestic transport modes which the activities under reference depend most heavily upon. They are particularly poor performers when judged by the economic efficiency yardstick. This is primarily due to insulation from the disciplines of effective competition.

While some improvements have been made in recent years (particularly when measured by historical standards), and efforts to achieve further reform are continuing, Australia is starting from a position of disadvantage compared with many of its competitors. And cost-reducing productivity gains are also being pursued elsewhere, so we have to run hard just to keep up with the competition. It is vital that Australia move quickly to establish an efficient transport system, if our exports are to avoid suffering an increasing transport penalty. Opening artificially reserved transport markets (such as coastal shipping and rail transport) up to competition is the best way to secure desirable changes in these areas.

In particular, greater competition (or even possibly just the threat of competition) in the market for ship- and shore-based shipping services would force changes to what have become institutionalised practices on Australian flag shipping and on the waterfront, and encouraging competition would
provide exactly the same incentives for improving performance as apply to most Australian industries.

In the case of road transport, the industry is already competitive and this keeps freight rates down. However, as there is increasingly compelling evidence that heavy vehicles are not being charged all the costs they impose on the community (particularly costs necessary to repair pavement damage), existing freight rates are, to that extent, artificially low. This situation should be corrected by charging trucks all attributable costs of using the public road system.

**Are labour costs excessive?**

Miners generally earn more than other Australian workers, in part because of the hazardous nature of much of the work. They also enjoy certain terms and conditions not available more generally. However, they are also among the most productive workers in the country, largely because they work in a capital intensive industry. Yet labour relations in the mining and mineral processing industries have been marked by often bitter confrontation. Coal mining in particular has the worst record of any Australian industry in terms of working days lost through industrial disputes. The resulting disruptions to production add greatly to costs (in both monetary and human terms) and undermine Australia's reputation as a reliable supplier of minerals.

Clearly, there are many areas where labour reform is urgently needed. For example, restrictions are imposed on mine operating times and employers must often hire from lists of available labour compiled by unions.

The Commission considers that better relations between employees and their managers and more productive working arrangements are likely to result where conflict resolution and negotiations are more decentralised, and where third party intervention is minimised.

In the Commission's view, award restructuring is pointing in the right direction in the mining and minerals processing industries. However, this process needs to be accelerated and implemented more rapidly and flexibly at the enterprise or minesite level. In particular, the scope of restructuring should include a review of all restrictive work practices, with workers sharing in the benefits from the reform of these practices.

The Commission is also of the view that the rationalisation of unions with the objective of developing a single bargaining unit (but not necessarily a single union) in each enterprise offers significant potential gains in productivity, competitiveness and rewards in the mining and minerals processing industries.

**Are energy costs too high?**

Energy costs represent a higher proportion of total operating costs for mining and minerals processing activities than for most Australian industries. Indeed, one way of thinking of the activities under reference in this inquiry is that their outputs embody significant amounts of energy (aluminium has been described as congealed electricity), so that - like transport - the competitiveness of these industries is influenced to a significant extent by the cost of energy inputs. Access to relatively cheap energy is often suggested as a crucial factor explaining why alumina and aluminium production has flourished in Australia in recent years.
Nevertheless, there is evidence which suggests that public electricity authorities are inefficient, resulting in higher than necessary electricity tariffs. Like transport, a primary reason for this is lack of effective competition.

While some improvements have been made in recent years, the Commission is convinced that considerable scope exists for achieving significant further improvements in the electricity supply industry by promoting competition within the industry (eg through open access to the transmission grid, more private electricity generation, and stronger interstate connections).

**Other influences on competitiveness**

*Should mining be exempt from the effects of macroeconomic policies?*

Many inquiry participants pointed to adverse macroeconomic influences on the competitiveness and therefore the economic performance of the mining and minerals processing sector. Pre-eminent were high nominal interest rates (which affect the cost of capital in what are capital intensive industries) and an over-valued exchange rate (even small movements in which - given the export orientation of the sector - can have large effects on revenues in Australian dollar terms).

Such factors influence all economic activities in Australia, though not necessarily to the same extent as activities under reference in this inquiry. Nevertheless, the Commission considers there is no reason to single out mining and mineral processing for special dispensation by insulating these activities from the effects of macroeconomic policies.

*Are research and development and access to technology adequate?*

Continual advancements in exploration, mining and processing technologies underpin the competitiveness of the activities under reference. The ability to appropriate the benefits of research and development (R&D) is a powerful incentive for companies to undertake their own (particularly applied) R&D. For example, coal mining companies are concerned about the lack of control they have over research and development activities financed by compulsory levies. The Commission considers that companies should have most of the say on how such funds are used, and questions the compulsory nature of such levies.

The appropriate role for government in providing support for mining and mineral processing R&D is to fund educational institutions which train technical staff for companies, as well as to fund universities and government agencies which conduct basic research (eg the Commonwealth Scientific and Industrial Research Organisation and the Bureau of Mineral Resources, Geology and Geophysics).

*Should tariffs be phased out?*

Removal of tariff (and similar) assistance for manufacturing and agricultural activities would greatly increase the value of mineral-based production, including value-adding activities. Most tariffs will be phased down to 15 or 10 per cent by 1992. The Commission strongly supports
current Commonwealth initiatives to lower tariff barriers and urges the Government to continue its program of progressive reductions in assistance.
FINDINGS AND RECOMMENDATIONS

Note. Cross-references in parentheses following individual findings/recommendations are to places in the Report (ie Volume 1) where these matters are discussed.

ACCESS TO LAND

Ownership of minerals

Findings:

• It is not self-evident that the Australian system of Crown ownership of minerals (whereby governments manage these resources on behalf of the people) leads to the most appropriate development of mining and minerals processing activities in this country. (Sec 2.1)

• Private ownership of minerals has much to commend it in terms of the efficient development and use of minerals, and in resolving land-use conflicts. (Sec 2.1)

• However, moving to a system of private ownership would involve substantial practical problems and perceived inequities of transferring ownership of assets of unknown value to private hands. (Sec 2.1)

• On balance, the Commission accepts that a general departure from Crown ownership of minerals is not justified at present. (Sec 2.1)

• The existing system of Crown ownership would be improved if current approaches taken by all levels of government (ie Commonwealth, State/Territory and local) to charging for access to minerals were rationalised. (Sec 2.1)

Aboriginal land rights

Situation in the Northern Territory

Findings:

• The granting of land rights and the power to deny others access to Aboriginal land (considered necessary to maintain the integrity of those rights) provides traditional Aboriginal owners with what effectively amounts to de facto control over any minerals on their land (subject to a national interest provision). (Sec 2.2)

• The Commission accepts that Aborigines should have a right to veto mineral developments on their land. This right of veto should be subject only to the normal exercise of the national interest powers of the Commonwealth Parliament. (Sec 2.2)
• Insisting - as the 1987 amendment to the Aboriginal Land Rights (Northern Territory) Act 1976 did - that a consent to explore implies agreement to mining is an unnecessary complication. (If this amendment was made with a view to expediting negotiations, it appears to have been unsuccessful.) (Sec 2.2)

• The holding of land rights by Aborigines may lead to lower levels of mining (and more particularly exploration) activity in the Territory, relative to those which would otherwise have occurred. However, provided Aboriginal land-owners face appropriate incentives, it would be wrong to conclude from this that land and sub-surface resources were not being devoted to their socially optimal use. (See 2.2)

• Current arrangements for distributing royalties (strictly speaking royalty equivalents) from mining to Aborigines in the Territory reduce the incentives for any one group of traditional Aboriginal owners to agree to exploration/mining on their land. This situation represents an impediment to the efficient development of mining and mineral processing in the Territory. The efficiency objective would be more effectively served if the share of royalty equivalents received by traditional owners were to be increased. (Sec 2.2)

• The Commission can see no reason why the ability of Land Councils to fulfil their statutory functions - such as identifying who are the traditional owners of particular tracts of Aboriginal land and assisting in land claims - should depend on the level of royalty equivalents, which in turn reflect the level of royalties paid by mining companies. (See 2.2)

Recommendations:

• The Northern Territory and Commonwealth Governments investigate transferral of mineral rights on Aboriginal land to the traditional owners. (The Commission sees granting traditional owners de jure rights to any minerals found on their land as a possible solution to a great many of the problems currently being experienced as a direct result of ill-defined property rights. Such a development would also make most of the recommendations which follow redundant.) (See 2.2)

• Where an association (or other corporate body) is formed by traditional Aboriginal owners, that association/body be free to negotiate access agreements directly with mining companies if that is the wish of the relevant traditional owners. In addition, such bodies be free to appoint any agent traditional owners choose to negotiate on their behalf. (The South Australian Pitjantjatjara: Land Rights Act 1981 provides an example of an association of traditional owners negotiating on their own behalf.) (Sec 2.2)

• In situations where there is an Exploration Licence Application made over an area that is not under the responsibility of an association (or other body expressly formed to represent traditional Aboriginal owners), the relevant Land Council determine who the traditional owners are and accept instructions from them with respect to the conduct of negotiations (if any) with the explorer. (Sec 2.2)
• The right to explore on Aboriginal land not be automatically tied to the right to mine. (Whether or not agreements made are conjunctive or disjunctive should be up to the parties concerned.) (Sec 2.2)

• The share of royalty equivalents currently earmarked for the administration of Land Councils be paid to the Aborigines on whose land mines are established. (Ibis would increase their share of royalty equivalents from 30 to 70 per cent and the Commission is confident that this would go a long way towards providing more appropriate incentives for traditional owners to make the 'best' decisions from their own and the nation's point of view.) (Sec 2.2)

• Land Councils - as statutory bodies with functions and responsibilities conferred under Commonwealth legislation - be funded to undertake their functions/responsibilities (including identifying traditional owners of Aboriginal land and pursuing land claims) from the Commonwealth Budget. (Sec 2.2)

• Since the Australian taxpayer would then be paying for the administration of the Land Councils on top of the royalty equivalents, the Northern Territory Government, which receives the mineral royalties and gains most from mining, shoulder some of the burden by funding a proportion of the royalty equivalents paid to Aborigines in the Territory. (The split as between the Commonwealth and Northern Territory Governments could be negotiated in the context of the Commonwealth Grants Commission process.) (Sec 2.2)

• If either the traditional Aboriginal owners or the prospective miner declare that agreement cannot be reached over the terms and conditions of an Exploration Licence Application (granted under normal procedures by the Northern Territory Government), the area become available for application by other parties should this be the wish of the traditional owners. (This would provide an opportunity for traditional Aboriginal owners to deal with a company which meets their requirements.) (Sec 2.2)

• Traditional owners be able to specify the conditions under which holders of Exploration Licence Applications can re-apply for permission to explore, rather than have a legislatively determined period of five years imposed upon them. (Thus, if traditional owners wish to refuse permission to explore for an indefinite period, they should be able to do so. Similarly, if they wish to refuse access to any part of their land, they should be able to do so - rather than being required, as at present, to make a decision over each and every application impinging upon their land.) (Sec 2.2)

**Situation in the States**

*Finding:*

• Aborigines generally have a special relationship with the land and strongly desire to control access to their traditional lands. Lack of such control in some States, combined with the absence of a suitable framework for miners and Aborigines to use in their negotiations, appears to be causing unnecessary and lengthy delays (eg before companies know whether they will be permitted access to certain areas). (Sec 2.2)
• There is an agreed need to have the ground rules regarding access to land clearly established (eg via enactment of a transparent process of negotiation). (Sec 2.2)

• Aborigines are generally not opposed to exploration and mining per se. But they are opposed to not being able to control what happens on and to their land (or what they regard as their land). (Sec 2.2)

Rights of other private landholders

Findings:

• Land-use conflicts between miners and private landholders reflect problems with the way property rights to land and minerals are specified. (Sec 4.7)

• There is a good case for reviewing existing legislative arrangements covering the rights of landholders affected by explorers/miners wishing to exercise mineral rights, where this has not already been done (or done inadequately). Important issues to be resolved by such a review include the circumstances in which compensation would be payable and formal access arrangements (including codes of conduct). The arrangements now operating in NSW would seem to provide a useful model for other States/Territories to consider. (Sec 4.7)

Public land-use conflicts

Findings.

• Existing institutional arrangements for resolving conflicts between miners and those advocating use of land for other public purposes (eg for conservation) have proved inadequate. A basic problem is that present processes for resolving conflicts do not allow sufficiently for an objective balancing of costs and benefits of conservation/development. This can mean that both conservationists and developers are able to achieve land-use decisions favourable to them, without necessarily having to bear all relevant costs. (Sec 4.3)

• Another problem is lack of certainty as to what processes will be followed in coming to such decisions. For example, the interaction between mining and other relevant State/Territory (and even Commonwealth) legislation (eg environmental and planning laws) is characterised by duplication and lack of coordination. This results in inefficient and drawn-out approval procedures which impose substantial costs, delays, and uncertainty which can jeopardise the viability of mining/mineral processing projects. (Sec 4.3 and See 4.5)

• Like any rational decision, the basic requirement is for the relevant costs and benefits of the alternatives to be systematically weighed. It should be borne in mind, however, that ascertaining benefits and costs itself involves costs (eg having to undertake cost-benefit analyses of various options). (Sec 4.2)

• There is considerable scope for increased use of market-based mechanisms for resolving many resource-use conflicts (which can obviate the need to invoke what usually turn out to be expensive public decision-making processes). However, in some cases market solutions may not prove feasible (eg because of the nature of conservation goods - where it may be impossible to exclude or charge consumers of these services). (Sec 4.5)
Recommendations:

- Possibilities for employing market incentives be pursued wherever feasible, in preference to reliance on governments to resolve land-use and related conflicts. (Sec 4.5)

- Where market-based solutions are judged not to be feasible, government imposed mechanisms for resolving land-use conflicts should:
  - allow for relevant costs and benefits to be first determined, then weighed;
  - promote certainty through well-defined rules and decision-making processes; and
  - assess costs and benefits in a way open to scrutiny by those affected by decisions (transparency). (Sec 4.3)

- Approval processes be streamlined by having one government agency responsible and accountable for processing a mining application within set time limits. (Sec 4.5)

- Because influence over land-use decisions transgresses jurisdictional boundaries, conflicts arising from the use of Commonwealth power over the States on environmental and land management issues (eg World Heritage listings) be addressed in suitable forums, such as the Special Premiers' Conference. (Sec 4.5)

- State/Territory governments critically review the range of regulations with which mining developments must comply, and remove those which are no longer necessary or duplicate others. If powers of discretion over the granting of mining applications are retained, the grounds on which refusals can be made should be prescribed in legislation and written advice stating reasons for a rejection should be required. (See 4.5)

Exploration and mining in national parks

Findings:

- Existing national parks have sometimes been declared without any assessment having been made of the area's mineral potential and without a convincing case being made that the entire area must remain immune from other potential land uses (such as mining). (Sec 4.6)

- Objective assessment of relative values of alternative land uses to society would require, in the case of national parks and similar areas, distinguishing between core ecological areas and buffer zones, and between different types of activity (eg exploration versus mining). (Sec 4.6)
Recommendations:

- Existing and proposed national parks be subject to assessment of relative costs and benefits of such a declaration. (This will generally mean permitting exploration and evaluations of other potential land uses.) (Sec 4.6)

- Governments in Australia consider adopting the South Australian regional reserve concept as a way of distinguishing between core ecological areas and areas of lesser fragility or importance. (Sec 4.6)

National Estate listings

Findings:

- Because the very name connotes places which sound as if they should be preserved at any cost, National Estate listings can frustrate rational assessment of the likely costs and benefits of alternative uses of land. (See 4.6)

Recommendation:

- To combat misunderstandings and misrepresentations of their nature and significance in the eyes of the public, the Commonwealth consider renaming the Register of National Estate Places (eg as the Australian Register of Places of Interest). Otherwise, remove land of ‘nature’ value from the purview of the Australian Heritage Commission on grounds that such areas can be adequately protected by other existing mechanisms (eg national park declarations). (Sec 4.6)

World Heritage listings

Findings:

- While protecting places of world significance is laudable, present listing procedures do not adequately allow for the values of alternative land uses to be taken into account. (Sec 4.6)

- There is a strong case for changing the procedures applying to Australian nominations for World Heritage listings, with the aim of ensuring that the values of all alternative land uses are adequately taken into account. Important in this regard is public input into some form of evaluation (eg Resource Assessment Commission inquiry) and the payment of compensation (by the Commonwealth Government as the proposer of the nomination) to individuals/companies or State/Territory governments which may suffer demonstrable loss as a result of a listing proceeding, and a requirement that nominations be accompanied by a draft management plan to provide more certainty to affected landholders. Such reform would clearly require co-operation between State/Territory and Commonwealth governments. (Sec 4.6)
Recommendations..

- Agreement on procedures to be followed in respect of World Heritage listings be resolved by negotiation between governments in Australia. (Sec 4.6)

- Landholders who suffer demonstrable loss as a direct result of World Heritage listings (e.g., State/Territory governments or holders of mining leases) be compensated by the proposer (i.e., the Commonwealth Government) and be provided with more certainty as to the future status of the land in question. (Sec 4.6)

**ALLOCATION OF MINERAL RIGHTS**

**Findings:**

- In order for the community to reap maximum benefit from publicly owned mineral resources, it is of fundamental importance that exploration (and other mineral) rights be allocated in such manner and subject to such conditions as permit those with the best information and expertise to acquire and exercise those rights. (Sec 3.4)

- More secure and less restrictive mineral rights would be much more valuable to those to whom such rights are transferred than is the case with existing exploration and mining rights. And more valuable rights from the point of view of the transferee would be more conducive to the community receiving an appropriate return for allowing others to exploit what are publicly owned non-renewable natural assets (because holders of such valuable rights will acknowledge their worth by striving to exercise them in the most efficient manner possible). (Sec 3.4)

- The Commission favours the allocation of long-tenure, freely tradeable mineral rights subject only to limited and well-defined conditions, because they would provide the most appropriate incentives for the efficient conduct of exploration and mining (and thus the maximisation of the value of Australians' collectively owned mineral wealth). (See 3.4)

- Exploration (as primarily an information-gathering activity) should generally be permitted, subject to appropriate guidelines (which would depend, *inter alia*, on the fragility of the area in question). Importantly, however, this view should not be interpreted as supporting claims that successful exploration should automatically lead to mining. (See 3.2)

- While explorers should not be given an absolute right to mine, there should be a substantial degree of certainty as to the processes which will be followed and how decisions on whether to permit mining will be made should exploration yield an economic deposit. (Sec 4.1)

- Work program bidding is demonstrably inferior as a method of allocating exploration rights and is likely to result in significant inefficiencies. (See 3.4)
Recommendations:

- Long-term (e.g., 99 year), tradeable mineral rights subject only to limited and well-defined conditions (e.g., pre-announced royalty arrangements and environmental safeguards) be allocated by competitive cash bidding. (Sec 3.4)

- The Commission envisages that such an auction would be triggered automatically whenever a formal application is made for an exploration licence over a particular area. The name of the applicant should not be made public and the auction should be run on the basis of sealed bids. (Sec 3.4)

- If governments are not prepared to offer potentially valuable mineral rights of the kind favoured by the Commission, preferring to stick with the more limited mineral rights associated with the status quo, the Commission agrees that 'first come first served' allocation systems are appropriate where there are poor prospects of significant competition to acquire those rights; that existing relinquishment provisions and the requirement for full revelation of exploration results also be retained; but considers that exploration permits not be subject to any conditions relating to work which must be carried out. (Sec 3.4)

Sovereign risk

Finding:

- Sovereign risk (the term used for governments changing the rules mid-project, thus eroding the value of private property rights) is a grave problem facing the mining industry in Australia, and one which represents a serious impediment to the efficient development of mining and mineral processing industries in this country because it diminishes the value of Australians' collectively owned mineral estate. (Sec 3.4)

Recommendations:

- In respect of the transfer of mineral rights to private hands, governments in Australia arrange the charging systems for allocating such rights (e.g., by adopting that combination of a cash bidding and pre-announced royalty system which best suits the position they wish to adopt as regards risk), so that they (or future administrations) will not be tempted to intervene subsequently to change the rules. (Sec 3.4)

- Governments bind themselves (and their successors) contractually to fixed rules governing mineral developments. (Sec 3.4)

ROYALTIES

Finding:

- Rent-based royalties are more efficient than output- and profit-based ones. (See 6.5)
• In practice all royalty systems may suffer from sovereign risk which adds unnecessarily to uncertainty in the industry. (See 6.5)

• The application of pre-announced royalties based on the net value (or economic rent) associated with a deposit would reduce reliance on cash bidding as a charging mechanism for allocating mineral rights of the type advocated by the Commission. (Sec 6.5)

• Royalty payments by mining companies are often incorrectly seen as revenues which can be used to finance government current consumption expenditure. Australia's mineral capital is a depleting asset as mines are established.

Recommendations:

• Recent moves to adopt royalty systems which incorporate a profit-based element be taken to their logical conclusion of charging pure-rent based royalties, to apply to metallic minerals and coal. (Sec 6.5)

• If a pure-rent royalty regime is adopted, existing projects should, within a short period of its coming into force, have a once-only option of changing to it. Further, projects which change over to rent-based royalties need to be given credit for capital investment not yet recouped. This could be done by allowing a deduction equal to the written down value of capital (eg as taken from taxation records) in the first period of calculation of cash flow. (Sec 6.5)

• The above recommendation should not apply to low unit value commodities (such as limestone and construction materials). For such commodities, rents (if they exist at all) are likely to be insignificant and increased administration costs compared with existing arrangements would likely outweigh any efficiency gains from changing royalty arrangements. (Sec 6.5)

• Royalties from mining be regarded as a capital transfer from minerals in situ and be accumulated in a Mineral Resource Capital account, to be used to retire public debt or to create capital assets.

TAXATION

Findings:

• Although immediate deductibility of exploration expenditures may involve an element of assistance, this 'concession' is the least distorting tax treatment in terms of the efficient allocation of resources. (Sec 3.6)

• The Commission supports recent moves to allow minisite rehabilitation expenses to be tax deductible (including demolition of old plant) but notes that some deductions will not be utilised because of insufficient income after operations have ceased. (Sec 6.8)

• While the Commission acknowledges the high tax burden prevailing in Australia relative to some of our competitors, it does not believe that Australia should attempt to match concessions offered by others. (Sec 7.5)
• The Commission agrees with the principle of levying capital gains tax on farmouts but notes that valuation problems raised by such transactions may be quite serious. As a result, the tax is likely to be levied in the case of farmouts on less than the full value of the assigned property. (Sec 3.6)

• Like other industries, mining and minerals processing activities are subject to various indirect taxes (such as import duties, State payroll taxes and sales taxes on inputs) which adversely affect their international competitiveness.

Recommendations:

• The definition of eligible exploration expenditure in Section 122J of the Income Tax Assessment Act 1936 be broadened beyond the existing tenement' definition to include all properly attributable exploration expenditure, including modern approaches such as remote sensing and 'desktop' research. Expenditures on feasibility studies which are essentially exploration related also be deductible under Section 122J. (Sec 3.6)

• Full liability for Fringe Benefit Tax apply to benefits provided by mining companies and other employers in remote areas, but that Zone Rebates - which are a more direct instrument - be increased to offset the effects. (Sec 6.6)

• Local government rates based on mining output be abolished. (Sec 6.6)

• Expenditure on minesite rehabilitation (including plant demolition) be 'carried back' for an adequate period if there is insufficient income to claim a deduction after mining finishes. (Sec 6.8)

• Mineral processing projects qualify for a deduction for company tax purposes in respect of the cost of plant demolition (and related costs) in areas where Zone Rebates apply for income tax purposes, and that these deductions be 'carried back' for a sufficient period if there is insufficient income to claim a deduction in the year in which such costs are incurred. (Sec 7.5)

• The cost of environmental impact assessments be depreciated over the life of successful projects. (Sec 4.5)

• Expenditures on housing and welfare directly related to mining and mineral processing operations be deductible for company tax purposes if they occur in regions where Zone Rebates apply. (Sec 7.5)

• The Commonwealth Government continue its program of progressive reductions in tariffs beyond 1992.
ENVIRONMENTAL CONCERNS

Mining and the environment

Findings:

- Exploration can harm the local environment, with the extent of possible damage varying greatly depending on the nature of the exploration activity and the fragility of the area being explored. However, this does not in itself justify banning exploration in certain areas. The real issue is whether the benefits flowing from this activity (in terms of information) outweigh the costs (including any damage to the environment). Other than in exceptional circumstances, the Commission considers there are likely to be net benefits from allowing exploration. (Sec 3.3)

- There is no reason why modern rehabilitation techniques should not prove to be generally successful, if success is understood to be reasonable compatibility with the surrounding area. Further, it may make more sense (in terms of the costs and benefits involved) to aim for compatibility with a range of other uses for post-mining land (such as for ongoing agricultural or commercial development), or to undertake only minimal rehabilitation (eg in areas of marginal conservation value). (Sec 6.8)

- Many mining-related environmental problems occur because of ill-defined property rights and obligations which are either unenforced or unenforceable. However, not all problems will necessarily be solved even if property rights are better defined, because of the presence of externalities not amenable to the exclusive assignment of rights - as well as the 'public good' nature of some environmental services. (Sec 6.8)

- Approaches to addressing environmental problems which harness market forces to the maximum feasible extent - such as effluent charges, performance bonds and transferable pollution permits - are to be preferred to traditional 'command and control' approaches which rely solely on regulation. What method would work best, however, depends on the particular mining and/or mineral processing operation and the threats posed to the surrounding environment, so that it is difficult to proceed beyond in principle recommendations. (Sec 7.11)

Recommendation:

- Mining companies be required to post rehabilitation bonds (or equivalent financial instruments) sufficient to cover the estimated costs of appropriate rehabilitation of the minesite. Further, governments could consider requiring the posting of 'performance' bonds (or equivalent financial instruments) in cases where it is judged that there is a demonstrable potential that a mining project could cause 'catastrophic' environmental damage, with such bonds being automatically forfeited should such damage occur. (Sec 6.8)
Mining and sustainable development

Finding:

• There was no evidence presented to the Commission that modern mining practices are inconsistent with sustainable development (including ecologically sustainable development). (Sec 6.8)

Environmental impact assessment

Findings:

• Environmental impact assessment as currently undertaken in Australia has numerous deficiencies. (Sec 4.5)

• The Commission is far from convinced that undertaking environmental impact analyses of proposed mining development projects of the type currently prepared is preferable to enlisting market-based mechanisms (eg pollution taxes) which may be able to achieve desired environmental outcomes at less cost. However, some form of environmental impact assessment may be necessary to set the parameters of certain market-based mechanisms, for example the size of performance bonds. (Sec 4.5)

• Where it is decided that going down the environmental impact analysis/statement route is appropriate, a better approach would be to confine environmental impact assessments/statements to being (as the name implies) primarily scientific studies which address:
  • the likely consequences for the physical environment of a proposed project (or series of projects where this is an issue), including what measures could possibly be taken to lessen or maximise the likelihood of environmental damage; and
  • what measures the proponent actually proposes to take to limit possible adverse environmental consequences. (Sec 4.5)

• If the administering authority considered a particular proposal (or series of proposals) to be particularly sensitive in terms of potential environmental consequences, a body with appropriate scientific expertise (such as the Commonwealth Scientific and Industrial Research Organisation) could:
  • discuss possible environmental consequences of the proposal(s) with the proponent, and therefore what the environmental impact analysis should desirably address (and possibly the most appropriate way to address various environmental concerns); and
  • provide its advice in writing both to the proponent and to the Department of Arts, Sport, the Environment, Tourism and Territories (or its equivalent State/Territory body). (Sec 4.5)

• A full reckoning of anticipated costs and benefits is likely to be an expensive and time-consuming path to go down, and the Commission would not advocate such
• a full cost-benefit approach, except in rare and clearly contentious cases. (Sec 4.5)

• In most cases government should make a decision on the acceptability of a project on the basis of the proponent's environmental impact statement, within strict time limits (unless an interested party obtains approval for an extension from an appropriate court). (Sec 4.5)

GOVERNMENT REGULATION

Commonwealth intervention in mineral trade

Findings:

• There is insufficient evidence of distorted purchasing arrangements to justify the use of export controls. (Sec 8.2)

• If government does possess superior market intelligence in the case of individual minerals, it should simply disseminate the information freely to the industry, rather than intervene directly in the market. It would then be up to firms' commercial judgment to act on such knowledge. (Sec 8.2)

• Export controls should not be used to conserve minerals for domestic use, since they can impose costs on suppliers in terms of having to forgo possibly more profitable overseas sales, as well as artificially reducing prices to domestic consumers - to the detriment of efficient resource allocation. (Sec 8.2)

• Export controls distort efficient resource allocation and inhibit the economic performance of mining and minerals processing activities. They also impose costs through delays in gaining necessary approvals, the uncertainty they engender for trading partners, and the resources they tie up in setting, monitoring and enforcing the regulations. (Sec 8.2)

• Australian mining and minerals processing industries would lose little if existing assistance benefiting these activities (eg services provided, or schemes run by the Australian Trade Commission or State governments) were removed. But they stand to benefit a great deal if assistance presently provided to other economic activities (eg via tariffs on imports) were to be phased out. (Sec 8.5)

• Various non-tariff and tariff measures of protection maintained by other nations adversely affect Australia's exports of mineral products, since they penalise low-cost mineral producers attempting to build market share, interfere with the rational development of new suppliers and growth in trade, and create additional distortions and uncertainties in the international market for minerals. (Sec 8.6)

Recommendations:

• Existing export controls - except those in relation to the Nuclear Non-Proliferation Treaty and Australia's bilateral safeguards agreements - be abolished. (Sec 8.2)
• Governments and their agencies not get directly involved in marketing mineral products. (Sec 8.3)

• The export duty on coal be abolished (ideally in concert with reform of State royalty arrangements). (Sec 8.4)

• The uranium export duty he abolished (ideally in concert with the introduction of more appropriate charging for any environmental damage attributable to uranium mining). (Sec 8.4)

• The Commonwealth Government continue its efforts to reduce barriers to international trade in minerals, both bilaterally and multilaterally. (Sec 8.6)

**Foreign investment regulation**

*Findings:*

• National interest arguments for differential foreign investment controls on mining are unconvincing. More direct measures (eg royalties, tax laws) exist to address any remaining concerns. (Sec 5.3)

• Foreign investment regulations lead to uncertainty, delays, administrative costs and inefficient project structures (eg inappropriate joint venture arrangements). Inconsistencies between the regulations applying to different activities (eg exploration as opposed to the development of a new mine), and between different "s of companies (eg naturalised and naturalising companies) can also distort economic activity. (Sec 5.3)

*Recommendation:*

• Foreign investment regulations applying to mining be brought into line with those applying to industry generally. (Sec 5.3)

**State/Territory and local government regulation**

*Finding:*

• State/Territory Mining Acts often rely on outmoded concepts not conducive to modern mining methods, allow for an unwarranted degree of administrative or Ministerial discretion to be exercised, and are sometimes inconsistent when there is no good reason for different approaches to be adopted. Many provisions in these Acts also unnecessarily restrict the decision-making powers and flexibility of companies to adapt to changing conditions, thereby inducing inefficient behaviour in the industry. (Sec 6.7)

*Recommendation:*

• State/Territory Governments review their Mining Acts to take account of advances in technology, to limit the scope for ministerial or bureaucratic discretion, and to modify those provisions which currently induce inefficiencies (eg expenditure conditions). Consideration also be given to some form of co-ordinated review to promote consistency between States/Territories where this would be in the interests of the nation as a whole. (Sec 6.7)
CONSTRUCTION AND OPERATING COSTS

Provision of infrastructure

Finding:

• It is only to be expected that construction costs are higher in remote sites because of distance-related costs. However, labour market characteristics and construction industry inefficiencies may add unnecessarily to costs. (Sec 5.2)

Recommendation:

• Mine developers pay for industrial and social infrastructure necessary to enable mineral revenue to be earned. However, governments should pay for social infrastructure normally provided publicly - such as health, education and law enforcement. Where the provision of infrastructure by mining companies will benefit others (but is not privately viable), there is a case for requiring a contribution from other beneficiaries (or by governments on their behalf). (Sec 5.1)

Transport of minerals

Findings:

• Since the mining industry is a significant user of rail services with rail charges often accounting for a substantial proportion of total costs, cost and pricing inefficiencies in publicly provided rail services which express themselves as excessive freight charges will undermine the competitiveness of our natural resource-based products on world markets. The focus of reform should be on promoting competition for the supply of rail services. (Sec 6.3)

• Although the mining industry is not an extensive user of road transport to get mine outputs to port, the road transport industry has a good record of providing high levels of service, and Australian long-distance road freight rates appear to represent some of the most competitive in the world. However, there is evidence that heavy vehicles do not cover the cost of attributable damage to the public road system, let alone such external costs as noise, pollution and accidents. (See 6.3)

• Despite recent initiatives to increase productivity, the Australian shipping industry cannot afford to be complacent. Australia is starting behind other nations and must improve faster than other potential suppliers of shipping services to prevent the competitiveness of users of such services in Australia being unnecessarily compromised. (Sec 7.3)

• Greater competition (or even possibly just the threat of competition) in the market for ship- and shore-based shipping services would force changes to what have become institutionalised practices on Australian flag shipping and on the
waterfront, and encouraging competition would provide exactly the same incentives for improving performance as apply to most Australian industries. (Sec 7.3)

**Recommendations:**

- Rail services be made more competitive (for example, by removing restrictions on road transport and by selling rights to use the permanent way, with provision for those gaining access to the network to own/lease, operate and maintain their own rolling stock and locomotives if they so choose). (Sec 6.3)

- Restrictions on competition between road and rail transport be abolished, but heavy vehicles be charged the full costs of using the public road system, while charges be based on the full cost of providing services. (Sec 6.3)

- Coastal shipping operations be subject to foreign competition and competitive disciplines be brought to bear on port and waterfront activities to the maximum possible extent. (Sec 7.3)

**Labour**

**Findings:**

- Better relations between employees and their managers and more productive working arrangements are likely to result where conflict resolution and negotiations are more decentralised, and where third party intervention is minimised. (Sec 6.2)

- Award restructuring is pointing in the right direction in the mining and minerals processing industries. However, this process needs to be accelerated and implemented more rapidly and flexibly at the enterprise or minesite level. In particular, the scope of restructuring should include a review of all restrictive work practices, with workers sharing in the benefits from the reform of these practices. (Sec 6.2)

- Rationalisation of unions with the objective of developing a single bargaining unit (but not necessarily a single union) in each enterprise offers significant potential gains in productivity, competitiveness and rewards in the mining and minerals processing industries. (Sec 6.2)

**Energy**

**Finding:**

- Inefficiencies in the public provision of electricity are adversely affecting the competitiveness of mining and mineral processing industries. (Sec 7.4)

- While some improvements have been made in recent years, considerable scope exists for achieving significant further improvements in the electricity supply industry by promoting competition within the industry (eg through open access to the transmission grid, more private electricity generation, and stronger interstate connections). (Sec 7.4)
OTHER INFLUENCES ON COMPETITIVENESS

Macroeconomic factors

Finding:

• There is no reason to single out mining and minerals processing industries for special
dispensation by insulating them from the effects of macroeconomic policies directed at all
economic activities. (Sec 5.3)

Research and development and access to technology

Finding:

• Advancements in technology are an important factor underpinning continued growth and
development of mining and early-stage Minerals processing industries. Australian early-stage
mineral processing and mining companies appear to have adequate access to relevant
technology. (Sec 7.9)

SPECIAL TOPICS AND CASE STUDIES

Coronation Hill and the Kakadu Conservation Zone

Finding:

• The Coronation Hill/Kakadu Conservation Zone experience graphically illustrates the need to
device better systems for making land-use decisions. Current approaches are creating great
uncertainty and cost for all those with a stake in the outcome. (Sec 4.3)

The coal industry

Finding:

• Changed conditions have in many cases weakened or totally negated the original rationales
justifying government intervention in the coal industry. In the face of changed circumstances
and the now highly competitive nature of international coal markets, retention of inappropriate
regulations is impeding the efficiency and economic performance of the industry. (Sec 6.7)

• The coal industry is prepared to meet its own research and development needs and can capture
the resultant benefits, hence there is no justification for further government intervention in the
form of a research and development levy. (Sec 6.7)
Recommendations:

- The Joint Coal Board and the Queensland Coal Board be disbanded and any necessary ongoing functions allocated to other existing bodies. (Sec 6.7)

- The NSW and WA Coal Industry Tribunals be disbanded and their functions be subsumed by the Industrial Relations Commission (or appropriate State body). (See 6.7)

- The research and development levy be abolished. If it is retained, research programs be responsive to industry needs and adhere to strict cost-benefit criteria. (Sec 6.7)

The uranium industry

Finding:

- There are no persuasive reasons to limit the number of uranium mines operating under appropriate environmental controls and safeguards. (Sec 4.8)

Recommendations:

- The 'three mines' policy and any controls on prices be abandoned so that there is no restriction on the number of uranium mines in Australia. (Sec 4.8)

- Government intervention be limited to ensuring adequate safeguards with respect to the mining, processing, transport and use of uranium. (Sec 4.8)

- Governments in Australia allow uranium to be enriched here if a normal commercial opportunity should arise, subject to appropriate environmental and other safeguards. (Sec 7.11)

Office of the Supervising Scientist

Finding:

- There are substantial problems in the administration of mining activity in the Alligator Rivers Region due to overlapping responsibilities held by the Supervising Scientist for the Alligator Rivers Region and Northern Territory regulatory authorities (eg the Department of Mines and Energy). (Sec 6.8)

Recommendations:

- The functions of the Australian National Parks and Wildlife Service be expanded to accommodate the supervisory interests of the Commonwealth Government in the environmental management of Kakadu National Park (as presently exercised by the Office of the Supervising Scientist). (Sec 6.8)

- The regulatory responsibilities of the Northern Territory Government for mining and mineral exploration activity in the Alligator Rivers Region be clarified. (Sec 6.8)
• The research functions of the Office of the Supervising Scientist be transferred to competent scientific bodies (eg the Commonwealth Scientific and Industrial Research Organisation or the Australian Nuclear Science and Technology Organisation) and funded on a user-pays basis. (Sec 6.8)

• Charges to cover environmental monitoring and protection of Kakadu National Park be levied on all users whose activities affect the Park (eg the township of Jabiru and visiting tourists), rather than being confined essentially to the Ranger uranium mine. (Sec 6.8)
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<td>NSW</td>
<td>New South Wales</td>
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<tr>
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<td>ACT</td>
<td>Australian Capital Territory</td>
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### Companies/Organisations

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<td>AAEC</td>
<td>Australian Atomic Energy Commission</td>
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<tr>
<td>ABARE</td>
<td>Australian Bureau of Agricultural and Resource Economics</td>
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<td>Alcoa</td>
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<td>Australian Labor Party</td>
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<td>AMEC</td>
<td>Association of Mining and Exploration Companies</td>
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<td>Australian Mining Industry Council</td>
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<tr>
<td>ASSPA</td>
<td>(NT) Aboriginal Sacred Sites Protection Authority</td>
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<td>ATSIC</td>
<td>Aboriginal and Torres Strait Islander Commission</td>
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<td>CAI</td>
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<td>CHJV</td>
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<td>CLC</td>
<td>Central Land Council</td>
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<td>CRA</td>
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<tr>
<td>CRL</td>
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<td>DASETT</td>
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<td>DME</td>
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<td>DPIE</td>
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<td>Export Finance and Insurance Corporation</td>
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<tr>
<td>EPAC</td>
<td>Economic Planning and Advisory Council</td>
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<tr>
<td>ERA</td>
<td>Energy Resources of Australia Ltd</td>
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<tr>
<td>EXXON</td>
<td>EXXON Coal and Minerals Australia Limited</td>
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<tr>
<td>FIRB</td>
<td>Foreign Investment Review Board</td>
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<tr>
<td>GATT</td>
<td>General Agreement on Tariffs and Trade</td>
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<td>IAC</td>
<td>Industries Assistance Commission</td>
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<td>IBA</td>
<td>International Bauxite Association</td>
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<tr>
<td>IRC</td>
<td>Industrial Relations Commission</td>
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<tr>
<td>ISC</td>
<td>Inter-State Commission</td>
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<tr>
<td>IUCN</td>
<td>International Union for the Conservation of Nature and Natural Resources</td>
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<tr>
<td>JCB</td>
<td>Joint Coal Board</td>
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<tr>
<td>KCC</td>
<td>Kembla Coal &amp; Coke Pty Ltd</td>
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<tr>
<td>LCA</td>
<td>Local Coal Authority</td>
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<tr>
<td>MIM</td>
<td>MIM Holdings Ltd</td>
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<tr>
<td>NATA</td>
<td>National Association of Testing Authorities Australia</td>
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<tr>
<td>NCA</td>
<td>National Coal Authority</td>
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<tr>
<td>NERDDC</td>
<td>National Energy Research, Development and Demonstration Council</td>
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<td>NLC</td>
<td>Northern Land Council</td>
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<td>North BH</td>
<td>North Broken Hill Peko</td>
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<tr>
<td>NSWCA</td>
<td>New South Wales Coal Association</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OSS</td>
<td>Office of the Supervising Scientist (for the Alligator Rivers Region)</td>
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<tr>
<td>PSA</td>
<td>Prices Surveillance Authority</td>
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<tr>
<td>QCB</td>
<td>Queensland Coal Board</td>
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<tr>
<td>RAC</td>
<td>Resource Assessment Commission</td>
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<tr>
<td>SRA</td>
<td>State Rail Authority (of NSW)</td>
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<tr>
<td>TLCWA</td>
<td>Trades and Labour Council of Western Australia</td>
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<tr>
<td>UMFA</td>
<td>United Mineworkers Federation of Australia</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Educational Scientific and Cultural Organisation</td>
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<td>WIRA</td>
<td>Waterfront Industry Reform Authority</td>
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<tr>
<td>WMC</td>
<td>Western Mining Corporation</td>
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<tr>
<td>WWF</td>
<td>Waterside Workers Federation</td>
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### Other

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ABTA</td>
<td>Aboriginal Benefits Trust Account</td>
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<tr>
<td>ASIC</td>
<td>Australian Standard Industrial Classification</td>
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<tr>
<td>ATP</td>
<td>Authority To Prospect</td>
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<tr>
<td>BPT</td>
<td>Best Practicable Technology</td>
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<td>CBA</td>
<td>Cost-Benefit Analysis</td>
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<td>CRTA</td>
<td>Coal Research Trust Account</td>
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<td>CTCO</td>
<td>Commercial Tariff Concession Order</td>
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<td>CZ</td>
<td>Conservation Zone</td>
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<td>ECs</td>
<td>Environmental Conditions</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
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<tr>
<td>ELA</td>
<td>Exploration Licence Application</td>
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<td>ERs</td>
<td>Environmental Requirements</td>
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<td>ERTA</td>
<td>Energy Research Trust Account</td>
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<td>FBT</td>
<td>Fringe Benefits Tax</td>
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<tr>
<td>FCFS</td>
<td>First Come First Served</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>ICA</td>
<td>International Commodity Agreements</td>
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<tr>
<td>Mt U</td>
<td>Metric Tonnes of Uranium</td>
</tr>
<tr>
<td>NCSA</td>
<td>National Conservation Strategy for Australia</td>
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<tr>
<td>NPT</td>
<td>Treaty on the Non-Proliferation of Nuclear Weapons</td>
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<tr>
<td>PAYE</td>
<td>Pay as you earn</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
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<tr>
<td>RRT</td>
<td>Resource Rent Tax</td>
</tr>
<tr>
<td>U</td>
<td>Uranium</td>
</tr>
<tr>
<td>U3O8</td>
<td>Uranium oxide (yellowcake)</td>
</tr>
<tr>
<td>WOCA</td>
<td>World Outside Centrally Planned Economies Area</td>
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1 THE INQUIRY

Mining and early-stage minerals processing form a mainstay of the Australian economy, accounting for almost 10 per cent of gross domestic product and around 50 per cent of the total value of merchandise exports. After receiving a vast amount of material in submissions addressing key inquiry issues, the Commission is convinced that, although the activities under reference have played and continue to play an important role in the Australian economy, their potential has not been fully realised. This report sets out to identify significant impediments to the efficiency, international competitiveness and further development of Australia's mining and minerals processing industries and recommends courses of actions which, if adopted by governments, will enhance their contribution to national welfare. Importantly, national welfare includes not only that measurable in dollar terms (eg by national accounting aggregates such as net national product and national income) but also unpriced services, for example, being able to enjoy (and pass on to future generations) a habitable and largely unspoiled natural environment.

Australia is well endowed with mineral resources and has developed world-class mining and minerals processing industries. As a country, we are among the world's leading miners of coal, bauxite, diamonds, gold, iron ore, silver/lead/zinc ores, and titanium minerals (including rutile and ilmenite). In terms of processed minerals, Australia is a leading producer of alumina and aluminium.

The fact that mining and mineral processing accounts for almost a tenth of Australia's gross domestic product underscores the economic importance of the activities under reference in this inquiry. Indeed, such activities account for an even higher proportion of economic activity in Western Australia, Queensland, and the Northern Territory.

Mining and early-stage mineral processing activities more than satisfy the nation's basic industrial requirements for construction materials and industrial raw materials, so that we can also cater for overseas demands for many minerals. In fact, the sector accounts for nearly half of Australian merchandise exports.

Overseas markets for minerals are important to Australia because of the income they generate - enabling us to pay for imported goods and services which we do not have a comparative advantage in producing. By exchanging what we are good at doing for what we are not so good at, trade in goods and services enables Australians to enjoy a higher standard of living than would otherwise be the case.

Since mining and mineral processing activities tend to be heavily export oriented, developments in the world economy will have a more pronounced impact on these activities that on most sectors of the economy. For example, the geography of economic growth is important. With transport costs from Australia to other parts of Asia much less than from traditional centres of industry in North America and Europe, we are well placed to compete for the supply of raw materials to newly industrialising countries in our region.
Fluctuations in the value of mineral production will mean changes in production and incomes elsewhere in the economy, particularly in the short term. For example, if the mining and mineral processing sector experiences favourable conditions, profits will increase (which in the hands of Australian shareholders will likely translate into increased spending on goods and services); investment in these activities will be stimulated (benefiting suppliers of machinery and equipment and other necessary inputs); and demand for transport and handling services will increase.

1.1 What is this inquiry about?

The Commission has been asked to inquire into and report on key aspects of our mining and early-stage minerals processing industries. The reference (reproduced in full at Appendix A and at the front of the Overview of the report) specifies that the Commission report on any institutional, regulatory or other arrangements subject to influence by governments in Australia which lead to inefficient resource use, and advise on courses of action to reduce or remove such inefficiencies, while having regard to established social and environmental objectives of government.

As part of this inquiry, the Commission was directed to examine some specific factors: including allocation of mineral property rights; construction costs in remote sites; operating costs (such as energy, transport and labour costs); and access to technology, and the level of research and development - any or all of which may be impeding the efficiency, international competitiveness and further development of Australia's mining and minerals processing industries.

The reference also asks the Commission to consider the structure and efficiency of Commonwealth and State/Territory resource taxation and royalty arrangements, and to provide advice on the economic costs of different approaches to those objectives consistent with an appropriate return to the community for the exploitation of public resources.

It is appropriate to reiterate that the terms of reference for this inquiry extend to State/Territory and local levels of government, not just to interventions at the federal level. Accordingly, this report is addressed as much to State and Territory Governments (which own and control most of Australia's minerals) as it is to the Commonwealth Government.

1.2 How has the inquiry been conducted?

Appendix A (included at the end of this volume) sets out details of the conduct of the inquiry - including public hearings, submissions received, visits and discussions held.

1.3 What activities are under reference?

The terms of reference nominate Division B (Mining) of the Australian Standard Industry Classification (ASIC), excluding petroleum and petroleum products, as activities falling within

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1 ASIC is a classification of Australian industrial structure used by the Australian Bureau of Statistics for the collection, compilation and publication of its statistics. See ABS (1985) for a description of the classification.
the scope of the inquiry. Minerals processing activities under reference are less easily defined, however. The terms of reference specify that the report cover "value added processing of minerals, including coal, to the unwrought refined metal and alloy stage or the equivalent stage of processing of coal and industrial minerals." Appendix A includes a list of ASIC-based activities considered to be under reference.

This inquiry therefore covers a wide range of natural resource-based industries. The South Australian Chamber of Mines and Energy (sub. 132, p.5) stressed the diverse nature of the goods and activities under reference:

Production of individual mineral commodities in Australia ranges from only a few kilogrammes (eg gemstones) to many thousands of tonnes per year. Some, such as construction materials, have to be won near the site of use whereas others can be transported across the world and sold at a profit. The mining industry is as diverse as the kinds of materials it produces, ranging from small pits with a few employees to large underground mines and open cut quarries which employ several thousand people in mining and processing activities. The location of these operations varies from the remote and arid inland of Australia to the tropics and the fringes of major cities.

1.4 Why is this inquiry important?

This inquiry comes at a crucial time for the mining and minerals processing industries and, indeed, for the economy as a whole. If we are to prosper, our economy must become more productive. We must learn to do things better by doing things smarter (ie by becoming a "clever country"). In seeking to realise this ambition an obvious strategy is to build on our strengths, rather than trying to turn current weaknesses into strengths. The latter clearly could only be achieved over the longer run, if at all. Mining and (to a lesser extent) minerals processing are things which we are already demonstrably good at doing (ie they are activities in which we already enjoy a comparative advantage). Becoming even better at them is more likely to lead to more immediate and enduring gains in living standards than trying to create a comparative advantage in something that would have to be virtually built up from scratch.

Considering the size and importance of the industries under reference, even modest gains in efficiency will likely translate into sizeable and what should be sustainable additions to national income (through additional sales of largely unprocessed minerals or because it becomes worthwhile to undertake more processing of our minerals in Australia). Indeed, addressing the issue of why it is that we fail to add more value to mineral resources before exporting them is an important task of this report (see Chapter 7).

Because of the export orientation of many of our mining and early-stage minerals processing industries, these activities will be particularly sensitive to the trade and industry policies of other nations. Thus, protectionist measures put in place elsewhere in the world - such as subsidised exports or restrictions on imports - will distort trade flows, to the detriment of potential Australian suppliers. For example, the Federal Republic of Germany, the United Kingdom, and Japan all support high-cost domestic coal producers, thereby restricting import demand which Australia could otherwise contribute to satisfying.
Despite the fundamental importance of international influences, domestic policies and impediments play an equal, if not more important, role in influencing the economic performance of our mining and mineral processing activities. It is the purpose of this report to explore many such factors and to recommend to all levels of government in Australia courses of action which would reduce or remove inefficiencies adversely affecting these activities.

This inquiry also comes at a time of increasing public concern about environmental issues and when concepts such as ‘sustainable development’ have become popularised. Given the importance of such issues to the mining and minerals processing industries, the Commission hopes, through this report, to contribute to that debate.

1.5 What approach has the Commission taken?

In reviewing activities under reference, the Commission has, as required under its general policy guidelines, had regard to the desire of the Commonwealth Government to:

- encourage the development and growth of Australian industries that are efficient in their use of resources, self-reliant, enterprising, innovative and internationally competitive;

- facilitate adjustment to structural changes in the economy and to ease social and economic hardships arising from those changes;

- reduce regulation of industry (including regulation by the States and Territories) where this is consistent with the social and economic goals of the Commonwealth Government; and

- recognise the interests of industries, consumers, and the community, likely to be affected by measures proposed by the Commission.

These guidelines, together with the terms of reference for the inquiry, require the Commission to focus on economic efficiency issues\(^2\) - in particular on factors which impede the efficient development of the mining and minerals processing industries. While some might interpret this as leading inevitably to a ‘pro-mining’ stance on the part of the Commission, it is important to emphasise at the outset that existing institutional, regulatory or other arrangements subject to influence by governments in Australia (and proposals for change) are evaluated in terms of their likely effect on the economy and the community generally - not just on the industries under reference. In particular, the Commission considers that the appropriate framework for analysis needs to take account of environmental resources as well as mineral and other economic resources - a view shared by the Australian Conservation Foundation (sub. 68, p.2).

Commenting on the wide-ranging nature of the inquiry, the Australian Mining Industry Council suggested (sub. 29, p.15) that:

The terms of reference to the Commission specified by the Treasurer will require the broadest and most comprehensive inquiry ever undertaken by the Commission. This is in terms of both the size of the industry sector being examined and in terms of the issues

\(^2\) The concept of economic efficiency is explained at the end the Glossary of Mining and Mineral Processing Terms located at the end of this volume.
specified by the Government for consideration during the course of the inquiry and report to Government.

The Commission's approach has been to cover as many issues relevant to the terms of reference as possible. One practical consequence of this has been the necessity to present this report in several volumes - including an Overview which brings together in one place the Commission's many findings and recommendations. This volume contains the report proper. The discussion and conclusions herein are supported by commentary, statistics and quantitative analysis presented in a second volume, and more detailed consideration of issues in a third volume. Finally, a fourth volume contains supporting material, including documents and extracts reproduced from submissions, to illustrate particular aspects of (and views on) issues raised by the inquiry.

1.6 What are the main issues?

As noted above, the terms of reference for the inquiry and material received by the Commission cover a multitude of issues. There are several features of the economic, social, cultural and physical environment which are peculiar or of particular importance to mining and early-stage minerals processing industries. These include:

- Crown ownership of minerals in situ;
- the high-risk nature of many activities under reference (eg exploring for minerals);
- typically long lead times in getting projects on stream;
- diverse production processes and cost structures dependent, inter alia, on the particular characteristics of individual orebodies;
- at times inconvenient siting by nature of mineral deposits; and
- difficulties in establishing the value of necessary environmental inputs.

To focus the analysis, the Commission has found it useful to consider key issues under several main headings, although the interrelated nature of many of them should be stressed at the outset (eg the nexus between systems of allocating mineral rights and systems of charging for them).

Access to land is getting more difficult

Judging by submissions to the inquiry, many people consider access to land as the single most important issue facing the mining industry today. This is because gaining access to minerals requires access to and disturbance of the land above - which can bring miners into conflict with others who have different designs on that land. Part I of Volume 3 examines specific types of land-use conflicts involving mining and other uses - including use by Aborigines, use by private rural and urban landholders, and public land uses such as conservation or preservation. The Commission's obligation to take into account established social and environmental objectives of government is particularly pertinent to a consideration of these issues. Another important issue grouped under this heading is the relative efficiency of alternative ways of allocating mineral rights.
The environmental aspects of mining are causing increasing concern

Closely related to the land access issue are questions of the effects of mining and minerals processing on the environment and what should be done about them. This raises the currently topical concept of sustainable development - including questions of how best (including whether and when) to exploit Australia's mineral wealth. These issues, which impact on all stages of the processing chain (from exploration through extraction to minerals processing and the manufacture of finished products) are discussed in Part II of Volume 3.

Government regulation is stifling mining development

The mining and minerals processing industries are subject to a frustrating array of regulation, involving all levels of government. This ranges from Commonwealth regulation of mineral trade and foreign investment to approval processes and ongoing regulation of operations overseen by State/Territory Governments, right through to imposts and vetting by local government. Part III of Volume 3 examines the effectiveness and consequences for the efficient development of mining and mineral processing activities of government regulations and institutions.

Royalty systems and certain tax matters need to be reconsidered

As noted above, the reference requires the Commission to examine the structure and efficiency of Commonwealth and State/Territory resource taxation and royalty arrangements, and to provide advice on the economic costs of different approaches to meeting government objectives "consistent with an appropriate return to the community for the exploitation of public resources." This examination, together with an analysis of taxation arrangements generally, is presented in Part IV of Volume 3.

Containing mining and minerals processing costs to remain competitive is a constant challenge

The terms of reference specifically ask the Commission to examine operating costs such as energy, transport and labour costs (including on-costs) and the availability of these inputs. Part V of Volume 3 examines these issues in detail.

Other influences can also affect competitiveness

The Commission is also required to examine any other factors which may be impeding the efficiency, international competitiveness and further development of Australia's mining and minerals processing industries. Besides access to technology and the level of research and development (specifically mentioned in the terms of reference), Part VI of Volume 3 also briefly examines the importance of macroeconomic policy settings.

1.7 How is this volume structured?

To answer the question of why Australia fails to earn as much as it seemingly could if we added more value to our minerals before selling the resulting products, it is necessary to examine critically all impediments from the beginning of the mining process to the end-processing stage. In this volume, the discussion of issues raised by the inquiry is ordered according to the various stages of the total mining and minerals processing sequence.
Figure 1.1: The stages of mining and mineral processing

A schematic representation of the overall mineral supply process is provided in Figure 1.1. Of course, this is a generalised representation of what is in reality a diverse set of activities (involving different techniques, characteristics of orebodies etc). In practice, not all stages are undertaken in all cases (eg processing of particular minerals may not proceed beyond basic minesite operations such as washing and sizing). Moreover, some stages are often undertaken concurrently (eg extraction and further exploration, extraction and further mine development). Nevertheless, structuring the subsequent analysis and discussion within the context of a progression which is broadly familiar to both miners and others interested in their activities has its advantages in terms of providing a logical framework to consider the many issues raised by this inquiry.
Some of the issues canvassed above are important only in a limited number of stages of the total mining process (eg access to land is most relevant to exploration and to mine approval and development). Other issues may be relevant to more than one stage, but may be substantively addressed under only one of them. Yet other issues (eg environmental concerns) are relevant at most stages, but have aspects unique to (or more important for) specific stages (eg the environmental impacts of exploration differ from those associated with extraction and minesite rehabilitation, which in turn differ from those associated with minerals processing). The presentation of issues by stage is nevertheless useful in building up a coherent picture of the impediments to the efficient use of Australia's resources (including minerals, land, environmental resources, capital and labour) as one moves through the mining chain from ownership of minerals in the ground and initial exploration right through to early-stage processing of minerals.
2 OWNERSHIP OF MINERALS

Most mineral rights in Australia are vested in the Crown. In practice, this means that control over exploration and mineral development in Australia is largely exercised by State and Territory governments. The existing system, which often creates conflict because surface and sub-surface rights are exercised independently, was nevertheless not seriously questioned by most inquiry participants. However, since the way in which ownership rights over potentially valuable assets are specified, exercised and enforced has a fundamental effect on the efficiency with which they will be exploited (and on the distribution of returns from their use), an examination of alternatives to Crown ownership of minerals is warranted. Such an examination suggests that systems involving private ownership of minerals would enjoy certain advantages, but would also entail disadvantages. While a general departure from Crown ownership is not justified at present, there is considerable scope for improving the current system. This chapter also addresses problems caused by poorly defined property rights and the resulting conflicts that can occur between Aboriginal land rights and those wishing to exercise mineral rights on that land.

Before exploration or any subsequent development of mineral deposits can take place, ownership of these resources must be settled so that potential explorers/developers can negotiate rights of access. The question of mineral ownership is therefore fundamental to mining and processing of Australian minerals.

Who currently owns mineral resources which lie on (or more likely below) the surface of the land? Is the existing system of mineral ownership in Australia in the community's best interests? If Crown ownership is retained, how could the system be improved? Should Aborigines be granted title to minerals found on their land? If not, how should their rights be weighed against those wishing to exploit mineral resources? This chapter addresses these questions and related issues.

2.1 Is the existing system of mineral ownership in Australia in the community's best interests?

In Australia ownership of minerals generally lies with the Crown (in practice State, Territory and Commonwealth governments), regardless of who owns the land on the surface. More precisely, ownership of minerals found onshore or within the three mile territorial limit falls to the relevant State/Territory government. The most important exception to this rule is that the Commonwealth retained its rights to uranium and other substances prescribed under the Atomic Energy Act 1953 following the granting of self-government to the Northern Territory in 1978.

As pointed out in Section 2 of Volume 3, minerals in Australia have not always been owned by the Crown. In the early years of settlement, British common law applied, under which all minerals except for gold and silver belonged to the owner of the land. The current ownership arrangements arose because governments in Australia progressively adopted a policy of reserving minerals from land grants. In Tasmania, because most land was alienated prior to the 1890s, private ownership of
minerals is widespread. Elsewhere, some mining leases granted prior to 1899 are still operational (eg the Hampton Plains Estate in the Coolgardie-Kalgoorlie region of Western Australia) and provide for the private ownership of minerals (except for gold and silver). In New South Wales, Aboriginal Land Councils have been granted title over minerals (except for gold, silver, coal and petroleum).

An important feature of the Australian system of Crown ownership is that most minerals are owned and controlled by State/Territory governments. Ownership of minerals by the States rather than the Commonwealth derives from the Australian constitution whereby matters not explicitly assigned to the Commonwealth default to the States. However, the Commonwealth is able to influence mineral developments because of its powers over such matters as international trade, customs and excise, taxation and loan raisings, people of any race, and external affairs. Use of these powers can in some cases severely restrict the ability of State and Territory governments to exercise their rights over mineral resources.

How do Australian governments exercise their mineral rights?

The above qualifications aside, it is generally State and Territory governments which own and control mineral resources on behalf of the people they represent. Usually, however, governments do not explore and develop these resources themselves, but confer rights to do so on private interests. Typically, mineral rights are not transferred outright; rather temporary ownership is effected via the granting (usually on the basis of 'first come first served') of exploration or mining leases which specify the terms and conditions (including the period) under and during which the assignee can exploit mineral resources contained within the assigned area (usually called a tenement).

Since governments in Australia typically allocate exploration and mining rights on a non-price basis (ie involving only a nominal fee), full payment (in the sense of what these rights are worth) is generally not received at the time of their allocation. Royalties and similar payments are examples of instruments designed to ensure that the community receives payment for the usage of public assets (see Chapter 6).

What are some of the alternatives to Crown ownership?

Several fundamentally different forms of mineral ownership and development regimes can be identified:

• the 'regalian' system where the state owns all minerals but leases or assigns rights to exploit these resources to private developers under set conditions;

• a system whereby state ownership of minerals is inalienable and where resources are developed either directly by state-owned entities or under contract by the private sector; and

• a system where ownership of minerals is tied to ownership of the land above.

In most countries one or other of these regimes predominates (but often in some combination with the others). In Australia, for example, mineral development generally occurs under the regalian system, but there is some direct public development of resources (eg brown coal in Victoria), as
well as some private ownership of minerals attaching to surface rights. In the USA, there is significant private ownership of minerals on private land, as well as state ownership of minerals on public land. Developing countries are usually characterised by systems which allow government to closely control development (see, for example, Emerson 1984 and Ndulo 1986).

What are the relative merits of alternative systems?

How do these systems compare? In particular, does the existing system in Australia - characterised by Crown ownership and separation of mineral rights from land rights - provide for the exploitation of Australia's mineral resources in a way which maximises the benefits to the nation?

The way in which ownership rights over assets are specified has a fundamental effect on both the efficiency with which they are used (economic efficiency) and on the distribution of returns from their use (equity).

The basic tenet of Crown ownership of minerals is rarely questioned in Australia. This seems to reflect a widely held belief that mineral deposits are fortuitous gifts of nature and that the benefits from their exploitation should accrue to the community as a whole, rather than to whoever happens to own the surface rights. Indeed, the terms of reference for this inquiry specifically ask the Commission to provide advice on the economic costs of different approaches to meeting certain social and environmental objectives "consistent with an appropriate return to the community for the exploitation of public resources." The United Mineworkers Federation of Australia (sub. 23, p.8) considered that:

Mineral resources are public property. They are non-renewable resources which are the birthright of the citizens of Australia. They are held in trust by the governments of Australia who have a mandate to ensure that they are conserved and utilised efficiently and effectively in the interests of those they have been elected to represent.

Whilst it might be 'fair' that any net benefits arising from mineral exploitation should accrue to the community as a whole as owners of these natural resources, governments may not always act to secure the maximum possible return on behalf of their constituents. This may be at least partly because governments tend to have a broader range of objectives than just trying to maximise the present value of the resources they control both from the perspective of acting to secure a 'fair' return for the right to exploit minerals and from the perspective of promoting the efficient development of mining and mineral processing activities in this country. Analysis presented in Appendix E of Volume 2 suggests that governments may well collect only a fraction of available mineral rents, in the process causing inefficient production decisions to be made (because they typically adopt suboptimal royalty schemes in their efforts to secure a return for the community).

The Australian Conservation Foundation commented (ACF, sub. 68, p.21) that "... given the high political rewards received by governments that foster perceived, successful resource exploitation it is not beyond possibility that some projects are subsidised to such an extent that they represent a net drain on the State economy". In respect of Tasmania, for example, the ACF (sub. 68, p.21) referred to a report which claimed that:
In only five years of the nineteen financial years since royalties were first introduced, or five of the twelve years since they were generally applied, has the revenue received, including royalties, exceeded the cost of the operation of the Mines Department.

Submissions to this inquiry from the mining industry generally expressed strong support for continued Crown ownership of mineral resources. Yet in other areas of economic activity - notably transport and energy and most notably mineral exploration - equally strong support was given to deregulation and/or commercialisation, on grounds that governments were not generally noted for their ability to run businesses efficiently.

It is also important to recognise that industry support for Crown ownership may reflect a belief that better deals can generally be struck with governments than with private individuals who own mineral rights.

On the other hand, the net contribution to the economy from mineral development will be reduced below its potential if government intervention serves to unnecessarily discourage mining. For example, the way in which mineral rights are allocated by governments in Australia may impede efficiency (this is discussed further in Chapter 3). Mechanisms for securing a fair return for the community in return for transferring the right to exploit publicly owned non-renewable resources to others (eg certain types of royalties) may also lead to inefficiencies - by distorting production decisions (see Chapter 5 and Appendix E). An already excessive preoccupation with who is going to get what share rather than on the size of the mineral cake may well be heightened where, as in Australia, several levels of government are involved.

A number of considerations, suggest that the owners of minerals in Australia - State/Territory and Commonwealth governments - may not necessarily manage these resources in a way which ensures that the community receives the maximum possible benefit from them. These include confused or incorrect signals to public sector managers (eg those in mineral and resource departments) about government expectations, pursuit of objectives other than attempting to maximise the value of Australia's mineral wealth (eg actively encouraging development in remote areas wherever and whenever possible), and a desire to be seen as either 'pro' or 'anti' mining. Essentially, these are the same factors which lead many commentators (including the mining industry) to question the ability of governments to effectively manage other public sector assets (eg run government business enterprises).

It is not self-evident that the Australian system of Crown ownership of minerals (whereby governments manage these resources on behalf of the people) leads to the most appropriate development of mining and minerals processing activities in this country.

A system of private, rather than public ownership, would provide strong incentives for owners of mineral resources to act solely in a manner which maximises their expected net present value.
Several participants suggested that a system based on private property rights would restrict mining activity because of potentially prohibitively high 'transactions' costs associated with having to negotiate access arrangements with more than one landowner, particularly where access to relatively large areas of land is required (eg in the early stages of exploration). The Australian Mining Industry Council (AMIC, sub. 95, pp.18-9) commented that:

For the United States, exploration and mining of lands with Federal- and State-owned minerals is more extensive than for areas with private minerals. The industry view is that exploration and development has been fostered on these lands because access was available to large tracts of land necessary for modern exploration. This is often not the case with private land where negotiations with many landowners are often necessary (and rarely successful) before exploration-size tracts of land can be accessed. In Canada, mineral development is more evenly dispersed, due to retention of Crown ownership of minerals...

The implied parallels with Australia may not, however, be as strong as the inference implied by the above quote may otherwise suggest. First, assigning sub-surface rights to whoever happens to own the surface rights would, in the vast majority of cases, merely serve to reinforce the status quo, since so much of the Australian continent (something like 70 per cent) has never been alienated from Crown ownership. Second, even if the rules were such that rights of access to minerals under Crown land had to be negotiated with the relevant landholder, many pastoral leases in Australia are of such a size that securing access to 'exploration-sized' tracts may very well only mean having to negotiate with a single landholder.

To some, then, Crown ownership of minerals is seen to have served Australia well through a system which effectively gives the rights of governments as owners of minerals precedence over the rights of owners of the land. For example, AMIC (sub. 29, p.34) considered that "the successful development of an economically pre-eminent mining industry in Australia is based on the concept of Crown ownership of minerals."

Implicit in such arguments is the historically well-established presumption that mining is a 'dominant' (if usually temporary) land use which it is in society's interests to encourage because the resulting benefits outweigh the costs. In more recent times, however, this presumption has been increasingly questioned - both because of higher values being attached to competing land uses and because of concerns that all of the costs of mining (eg costs of environmental damage) have not necessarily been taken into account. This re-evaluation has important implications for the choice of an appropriate system of mineral ownership.

Separation of mineral from land title complicates such assessments because there is then a need for some external mechanism to take into account the costs and benefits of decisions made by the owner of one asset (eg minerals) on the owner of the other (land). If this is not done at all, or done inadequately (eg if compensation payments are inadequate in relation to the costs imposed by exploration/mining), inefficient resource use decisions will result. A system which combines land and mineral ownership avoids these problems because the full costs and benefits of all actions affecting the land/mineral resource accrue solely to the owner. As discussed in Attachment 2A of Volume 3, private ownership - comprising the exclusive right to use an asset, appropriate the returns to it, and to transfer these rights to others - provides strong incentives to individuals to ensure that the resource is utilised in the manner which can be expected to generate the most wealth over time. Decisions on land use would then become ones made purely on economic grounds. In the words of Ackroyd (1988):
Ownership of minerals by the surface owner is compatible with allocation of mineral resources in the national interest. With rights to minerals the surface owner has regard to the economic value of alternative land uses and is in the best position ... to balance the value of mining (ie what miners are prepared to pay) against the value of alternative land uses. Complex planning procedures which attempt to evaluate the worth of alternative land uses and assess compensation to the surface owner are unnecessary. In addition full account is taken of the value a landowner places on the land; not just the commercial value.

Private ownership of minerals has much to commend it in terms of the efficient development and use of minerals, and in resolving land-use conflicts.

These benefits might be reduced, however, to the extent that other costs are incurred (eg transactions costs and other costs arising from the necessity to prevent separation of mineral and land titles). As noted by Barton (1989):

There is nothing, then, in the abolition of the Crown reservation and the "privatisation" of minerals that would preserve "combined" title. There is evidence that landowners in active mineral areas tend to separate their surface and mineral estates. Only by prohibiting that category of transaction and curtailing ownership rights could "combined" title be preserved.

Such fragmentation will increase transactions costs and may offset any efficiency gains from private mineral ownership. Barton suggests that the conflicts between the surface and mineral owner are likely to be worse than those under Crown ownership of minerals since, under common law, disputes would be resolved by reference to the terms of the legal instrument of severance. This would raise problems such as untraceable owners and old titles of uncertain effect. As noted by AMIC (sub. 95, p.19) in respect of mineral rights in the UK, "it is now often a thankless task to search titles, some going back many hundreds of years, to trace mineral ownership."

In the Commission's view, these considerations are not compelling arguments for the retention of Crown ownership. Transactions between explorers and landowners are still necessary under the current system (eg in negotiating compensation payments). However, if sub-surface rights were assigned inalienably to owners of surface rights (which would be the obvious way to institute a system of private ownership of minerals), there would be the difficulty of the perceived inequities of transferring ownership of assets of unknown value to whoever happens to own the land above. Perhaps the greatest practical problems of moving to a system of private ownership of minerals would be managing the transition from a situation where these rights are defined only in a most general way (ie mineral deposits, wherever they occur, are owned by the Crown) to a situation where a regime akin to the Torrens system of land ownership would have to be established from scratch - a daunting task.
Moving to a system of private ownership would involve substantial practical problems and perceived inequities of transferring ownership of assets of unknown value to private hands.

On balance, the Commission accepts that a general departure from Crown ownership of minerals is not justified at present.

**How could existing systems be improved?**

If Crown ownership is retained, it is important that the mechanisms put in place to assign and charge for mineral rights (e.g., exploration and mining rights) serve as far as possible to promote the efficient exploitation of Australia's mineral resources. Ways of improving incentives through alternative systems of allocating mineral rights are discussed in Chapter 3, while more efficient ways of charging for such rights are considered in Chapter 6.

Another problem with the existing system of Crown ownership is that whilst ownership of minerals (with the exceptions noted above) generally lies with State/Territory governments, other levels of government often behave as if they also had some right to securing a financial return from the exploitation of minerals. Examples include the imposition of export duties by the Commonwealth Government and local government rates based on the value of mine outputs. The efficiency of Crown ownership would be considerably improved if payments related to the use of community-owned resources were transparent and levied by only one level of government.

The existing system of Crown ownership would be improved if current approaches taken by all levels of government (i.e., Commonwealth, State/Territory and local) to charging for access to minerals were rationalised.

2.2 Should Aborigines be granted title to minerals on their land and how should Aboriginal land rights be weighed up against those wishing to exploit mineral resources?

It is common for prospective mining projects to be located in remote areas of Australia, sometimes in close proximity to Aboriginal communities. Consequently, there is significant potential for conflict between the rights of mining companies to explore for and mine publicly owned resources and the rights of Aborigines. Recently, these conflicts have been brought into sharper focus as miners extend their activities into ever more remote locations and against a political background of increasing calls to grant Aborigines comprehensive land rights.

What rights do Aborigines have over minerals and land which would have to be accessed to get to them? How do these rights and the way in which conflicts are currently resolved affect the efficiency and development of the mining and minerals processing industry? Do existing arrangements allow Aborigines to assert their rights effectively?

The issue of Aboriginal land rights raises complex moral and social questions. What is clear, however, is that existing mechanisms for resolving conflicts over use of Aboriginal land are unsatisfactory. The mining industry and potentially affected Aboriginal communities are both
dissatisfied with current arrangements. The discussion here focuses on underlying causes and economic consequences of existing arrangements and suggests some improvements, taking into account the social objectives of governments in relation to Aborigines. A more detailed discussion is at Section 4 of Volume 3.

The current policy of the Commonwealth Government (Australia, House of Representatives 1987) expressly recognises that:

... the Aboriginal and Torres Strait Islanders were the prior occupiers and original owners of the land [and that] it is the intention of the people of Australia to make provision for the rectification ... of the consequences of past injustices and to ensure for all time that the Aboriginal and Torres Strait Islander peoples receive that full recognition and status within the Australian nation, to which history, their prior ownership and occupation of the land, and their rich and diverse culture, fully entitle them to aspire.

Since Aboriginal land rights have had by far the greatest impact on mining in the Northern Territory and given that most relevant submissions concentrated on Aboriginal issues in the Territory and not the States, this chapter focuses first on the NT situation. This is followed by some discussion of the situation in the States and the Australian Capital Territory.

The situation in the Northern Territory needs to be addressed

The Aboriginal Land Rights (Northern Territory) Act 1976 (the Land Rights Act) was a Commonwealth Government initiative which pre-dated self-government in the NT.

Under this Act, property rights to minerals remained with the Crown, but title to land (in the form of unalienable freehold) was vested in Land Trusts on behalf of groups of Aborigines entitled by Aboriginal tradition to use or occupy the relevant land. Land Councils were established to ascertain and express the wishes and protect the interests of traditional owners in the administration of land held by the Trusts. The Land Councils, having consulted with relevant traditional Aboriginal owners, were given power to refuse consent to both the exploration and mining stages of projects on Aboriginal land. However, such a refusal to consent could be overruled by the Commonwealth Government if exploration and/or mining was considered to be in the national interest.

The Land Rights Act was amended in 1987 in response to claims by the mining industry that the legislation was proving unworkable and severely inhibiting resource development in the Territory. These amendments provide that, while the consent of traditional Aboriginal owners is still required before exploration can commence, consent cannot now be withdrawn if a company wishes to proceed to the mining stage. In addition, limitations have been placed on both the time allowed for the negotiation phase between traditional owners and companies and on the time traditional owners and Land Councils are allowed to decide whether or not to permit exploration, as well as on the amount of compensation payable at the exploration stage. Aborigines still have the right, however, to negotiate unlimited terms and conditions of development once a company wishes to proceed to the mining stage. If agreement cannot be reached, there is provision for conciliation and then
arbitration. The Land Rights Act was also amended so that if an Exploration Licence Application (ELA) is vetoed, no further application for that area of land can be made within five years of the veto, unless the Minister or the relevant Land Council intervenes. The Act specifies that only the original applicant (or a party that applicant agrees to) can reapply.

How efficient are existing arrangements?

Participants' views on how well the existing system works varied considerably. Some sections of the mining industry contended that the system was still unworkable, citing as evidence the low number of mining projects approved since introduction of the Land Rights Act. For example, AMIC submitted (sub. 29, p.37) that while the NT Government had offered some 284 exploration licences since 1981, as at 25 November 1989 only 21 agreements covering exploration on Aboriginal land had been finalised. Others, such as the Land Councils, strongly disputed that the system was "unworkable", but did acknowledge some problems.

The holding of land rights by Aborigines may lead to smaller levels of mining (and more particularly exploration) activity in the Territory, relative to those which would otherwise have occurred. However, provided Aboriginal landowners face appropriate incentives, it would be wrong to conclude from this that land and sub-surface resources were not being devoted to their socially optimal use. In this sense, the Commission largely agrees with the Northern Land Council (NLC, sub. 194, p.4) that "the real test of the workability of the Aboriginal Land Rights (Northern Territory) Act 1976 is not necessarily the amount of land under exploration, or the number of mines on Aboriginal land in the Northern Territory, but rather the extent to which Aboriginal landowners are able to freely exercise their ability to withhold or grant consent for exploration and mining."

Notwithstanding the above fundamental disagreements, there was widespread consensus that the existing system was not working as well as it might. In seeking possible solutions to these problems, the Commission does not attach blame to any of the parties involved. The Commission accepts, for example, the Aboriginal and Torres Strait Islander Commission's contention (ATSIC, sub. 178, p.5) that "delays and disagreements in negotiations occur for very many reasons - the situations are complex and it is difficult to attribute 'blame' to any one party ..." Rather, the Commission has examined the system from the point of view of the incentives created by its basic features and the effects they have on the efficient use of resources.

Is the extent of the rights conferred appropriate?

The Land Councils believe that land owned by Aborigines should include the right to minerals that might lie below that land. For example, the NLC contended (sub. 28, pp.16-7) that:

It is clear that Aboriginal ownership of land was, and is, not expressed in terms merely of the land surface. In much traditional lore which gives expression to Aboriginal peoples' spiritual connection with their land, the mythical forebears created the physical form of the land and emerged from within the ground and returned to it at different points in their travels. Their spirit essences still pervade those places and are retained in the soil and the rocks.
Both the NLC and Central Land Council (CLC) argued that mineral rights should be vested in traditional landowners in order to recognise the special relationship that Aboriginal people have with their land. However, recognising that previous inquiries which have considered this issue have consistently recommended that the Crown retain ownership over minerals, the Councils stressed (sub. 28, p.18 and sub. 38, p.9) the importance, in the absence of *de jure* mineral rights, of the need for Aborigines to completely control development on their land (arguably amounting to *de facto* mineral rights). The NLC (sub. 28, p.18) commented that:

> The control by traditional Aboriginal owners of their land is central to Aboriginal self-determination. It is the cornerstone of land rights - inalienable freehold title with control over who enters that land and what is done on the land or to it.

In support of this view, the NLC (sub. 28, p.20-1) noted that Indians in both the USA and Canada have an absolute right of veto. The Land Councils also noted that all major previous inquiries into Aboriginal land rights in Australia have supported the principle of control being given to traditional Aboriginal landowners.

AMIC (1989) considered that the existing legislation confers unwarranted precedence of the land rights of Aborigines over the rights of all Australians to access mineral resources:

> In seeking to promote the ideal of Aboriginal control over mining on their land, the [Commonwealth] Government created a legal/commercial system which left virtually total negotiating power in the hands of the Aborigines. This has thwarted the right and responsibility of the NT Government to control development of mineral resources, which belong to all Australians.

AMIC has advocated a system for accessing Aboriginal land on the same basis as that generally applying to landowners in Australia; that is, by negotiation (with provision for arbitration) over the terms of access - but with no landholder right of veto.

A number of Government inquiries (eg the Woodward, Fox, Toohey, and Seamen inquiries) have considered this issue and concluded that the right of veto over what happens on and to their land is an essential part of Aboriginal land rights. Justice Woodward (1974) stated "I believe that to deny Aboriginals the right to prevent mining is to deny the reality of their land rights." The Commission notes that while this represents a right not enjoyed by many other Australians, some other land uses do carry a right of veto (eg private agricultural land in Western Australia or land otherwise improved or developed - such as certain land on which houses have been built).

Although existing arrangements give Aborigines some special rights over their land, they still fall far short of full property rights. For example, Aboriginal wishes can be overridden if the Commonwealth Government decides that a development is in the national interest. There are also examples where Aborigines have given consent to mining or may be willing to do so (eg the proposed Jabiluka and Koongarra uranium mines), but government policy has prevented development going ahead. This effectively means that Aborigines do not have exclusive decision-making powers over what happens on and to their land. The Commission accepts that Aborigines should have a right to veto mineral development on their land subject only to the normal exercise of the national interest powers of the Commonwealth Parliament.
Once-only consent is causing problems

Amendments to the Land Rights Act in 1987 to remove the veto at the mining stage of a development has meant that Aboriginal groups have to consider the implications of a possible mine when deciding whether to allow exploration on their land. This complication makes for difficult and time-consuming decisions, particularly when so little information is available regarding any mining stage. The NLC argued (sub. 28, p.26) that Aboriginal people should have the right to give or withhold consent to projects at both the exploration stage and the mining stage. It argued:

To ask Aboriginal people to give their consent to a mining operation whilst providing absolutely no details of location, size, type, duration, effect on the environment or social impact of the potential mine, is patently unreasonable.

The NLC also suggested (sub. 28, p.29) that:

... traditional owners feel more comfortable about reaching agreement over exploration only. Aboriginal people have not in the past considered hypothetical questions as part of their culture. Questions commencing: "If company ABC were to find a mine, would you agree to ..." are odd and nonsensical to many Aboriginal people. The process including disjunction therefore is far easier for both traditional owners and the company and the agreement process is far simpler.

Insisting that a consent to explore implies agreement to mining is an unnecessary complication. If the 1987 amendments to the *Aboriginal Land Rights (Northern Territory) Act 1976* were made with a view to expediting negotiations, they do not appear to have been successful.

Forcing Aboriginal people to make agreements which are conjunctive (ie where exploration and mining are consented to at the outset, with terms and conditions negotiable if the project proceeds to the mining stage) substantially constrains the negotiating process. Negotiations without artificial external constraints would seem far more likely to result in mutually satisfactory agreements which adequately address the main concerns of both Aborigines (eg not wishing to consent to mining without any indication of what this might entail) and developers (eg wishing to have at least some security of progressing to mining should exploration prove successful).

The 1987 amendment to the Land Rights Act which removed the Aboriginal right to withhold consent at the mining stage was designed to shorten and improve the negotiation process, but has, if anything, further strained negotiations. In making their decisions, traditional Aboriginal owners must now take into account that they cannot prevent mining once they have agreed to permit exploration - they can only negotiate terms and conditions. This means that traditional owners can be more hesitant to allow exploration on their land.

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1 If agreement between the parties cannot be reached within twelve months (unless extended by mutual agreement) there is provision for conciliation and then arbitration – with the arbitrated decision binding on Aboriginals but not on the mining company.
The Commission considers that the right to explore on Aboriginal land should not be automatically tied to the right to mine. Whether or not agreements made are conjunctive or disjunctive should be up to the parties concerned.

As noted above, under the current system, if a Land Council refuses to consent to an ELA, there is a ban on further applications over the relevant land for five years, unless the Land Council or the Minister intervenes. The original applicant is the only one who can reapply, unless the applicant assigns the right to another party.

The Commission considers that if either the traditional Aboriginal owners or the prospective miner declare that agreement cannot be reached over the terms and conditions of an Exploration Licence Application (granted under normal procedures by the NT Government), the area should become available for application by other parties should this be the wish of the traditional owners. This would provide an opportunity for traditional Aboriginal owners to deal with a company which meets their requirements.

Several participants argued against this proposal, for example AMIC claimed (sub. 229, p.25) that it could lead to "unreasonable/unethical behind-the-scenes dealings between other companies and traditional owners in an attempt to undermine the position of the first-in-time company." The Commission does not accept this argument. The proposal is simply providing Aborigines with better-defined property rights and would increase the likelihood of genuine negotiation on mutually acceptable terms.

The Commission considers that traditional owners should be able to specify the conditions under which holders of Exploration Licence Applications can re-apply for permission to explore, rather than have a legislatively determined period of five years imposed upon them. Thus, if traditional owners wish to refuse permission to explore for an indefinite period, they should be able to do so. Similarly, if they wish to refuse access to any part of their land, they should be able to do so - rather than being required, as at present, to make a decision over each and every application impinging upon their land.

This would allow traditional Aboriginal owners to stop mining companies from 'humbugging' them into agreements (see Volume 4, 'Who speaks for the Jawoyn?', Item 2.e).

Representation of traditional owners needs to be sorted out

Another fundamental feature of the system is how Aboriginal landowners are represented. At present, it is one of the functions of the Land Councils to represent traditional owners in negotiations with proponents wishing to gain access to Aboriginal land. The NLC contended (sub. 28, p.41) that:
It is ... clear to most observers that without expert assistance being available to Aboriginal people, gross inequalities can, and in fact have, arisen in relationships between the parties.

Bridging of language and cultural gaps through co-ordinated multidisciplinary officers under Land Council direction gives an efficient and effective means through which Aboriginal owners can enter into resource development and, with an unbiased attitude to the issues of exploration and mining, can ensure an equitable resolution to all parties.

The mining industry argued that companies should be permitted to negotiate directly with local Aborigines, rather than having to go through Land Councils. For example, AMIC claimed (sub. 29, p.35) that:

... the recent history of industry negotiations with Aboriginal Land Councils for access have been a saga of mistrust, misinformation, procrastination, inefficiency, antagonism, ideological game playing and power politics. In turn, companies are frequently mistrustful of the capacity of Land Councils to objectively represent their position to traditional owners.

ATSIC (sub. 178, p.5) stated that "it is well known that some Aboriginal groups are dissatisfied with the existing major Land Councils and wish to establish separate Land Councils or, in some cases, negotiate directly with explorers and miners." ATSIC provided the Commission with documentation to support this claim, detailing attempts by some groups of NT Aborigines to split from the current Land Councils and form their own. Some of this information is reproduced in Volume 4, 'Dissatisfaction with the Land Councils'.

The Commission recommends that where an association (or other corporate body) is formed by traditional Aboriginal owners, that association/body should be free to negotiate access agreements directly with mining companies if that is the wish of the relevant traditional owners. In addition, such bodies should be free to appoint any agent traditional owners choose to negotiate on their behalf. (The South Australian Pitjantjatjara Land Rights Act 1981 provides an example of an association of traditional owners negotiating on their own behalf.)

The Commission wishes to stress that it is not advocating the abolition of Land Councils, or their automatic exclusion from conducting negotiations on behalf of traditional owners. Rather, it agrees with the Normandy Poseidon Group (sub. 224, p.15) that:

... the Land Councils have a significant role to play as agents to the traditional Aboriginal land owners, especially in the short term. We also acknowledge that as communities generally improve their commercial skills, their need or desire for agents may diminish. The legislative appointment of Land Councils as agents for Aboriginal people may restrain or inhibit development of commercial skills. To insist that Land Councils only can fill this role is paternalistic.
In situations where there is an Exploration Licence Application made over an area that is not under the responsibility of an association (or other body expressly formed to represent traditional Aboriginal owners), the relevant Land Council should determine who the traditional owners are and accept instructions from them with respect to the conduct of negotiations (if any) with the explorer.

In acclaiming the Indian Act in the United States whereby "rather than having some person or organisation taking some act regarding mining which is then subject to tribal consent, this Act simply provides that the tribe itself may make an agreement regarding mining if it wishes", the NLC noted (sub. 28, p.22) that this reflected "the relatively advanced point that Indian self-determination has reached in the USA in the last decade." The Commission's recommendations should be seen as providing the opportunity to move towards this situation.

The distribution of royalty equivalents should be changed

Under the current system, the royalty equivalents paid by the Commonwealth Government into the Aboriginal Benefits Trust Account are divided as follows: the traditional owners of the land upon which the mine is situated receive 30 per cent; the representative Land Council receives 40 per cent; and the remaining 30 per cent is for the benefit of NT Aboriginal people generally.

The CLC (sub. 193, p.11) stated that:

The intention of the distribution of monies under section 64 of the ... Land Rights Act is to spread the financial benefits from mining activity on Aboriginal land to the entire Aboriginal population of the Northern Territory. It was never intended that the overwhelming proportion of the financial benefits was to be restricted to those traditional Aboriginal land owners with mining on their land.

While this may well be true, it remains the case that the existing arrangements clearly reduce the incentives for any one group to agree to exploration or mining on their land. As noted by the CLC (sub. 38, p.7), "traditional Aboriginal land owners are more willing to enter into exploration agreements when they will receive an obvious and significant benefit from the activity at minimum cost to their cultural values." The current funding arrangements thus represent an impediment to efficient development of the mining and minerals processing industries in the Territory. The Commission believes that the efficiency objective would be more effectively served if the share of royalty equivalents received by traditional owners (the decision makers) were to be increased.

While increasing the traditional owners' share of royalty equivalents to 100 per cent would provide the clearest signals for traditional owners to make efficient decisions, this would involve a reduction in income for other NT Aborigines with uncertain effects. While the Commission can see no reason why a group of Aborigines with a mine on their land should be forced to share the proceeds with all other NT Aborigines, the Commission is not prepared to recommend changes in this area. The Commission is confident, however, that increasing the share of royalty equivalents going to traditional owners from 30 to 70 per cent will go a long way towards providing more appropriate incentives for traditional owners to make the 'best' land-use decisions from their own and the nation's point of view.
The Commission recommends that the share of royalty equivalents currently earmarked for the 
administration of the Land Councils be paid to traditional Aboriginal owners on whose land mines 
are established.

Some participants (eg ATSIC) were concerned that Aboriginal people who did not yet have mining 
on their land would not have access to funds to finance exploration negotiations as they do now 
because of the funding of Land Councils from mining royalty equivalents. This view is somewhat 
difficult to reconcile with the statements by the NLC (sub. 194, p.12) that "already the companies 
meet the bulk of the Land Councils and traditional owners costs of negotiation". It is difficult to 
see why this would not continue under the Commission's proposal. For example, Associations 
could make the provision of up-front funding for negotiations a pre-condition to any discussions at 
all.

*Funding of land councils needs to be properly addressed*

The Commission recognises that its recommended reallocation would deprive the Land Councils of 
their current source of funds - mining royalty equivalents. The Commission can see no reason why 
the ability of a Land Council to fulfil its statutory functions - such as identifying who are the 
traditional owners of particular tracts of Aboriginal land and assisting in land claims - should 
depend on the level of royalty equivalents which in turn reflect the level of royalties paid by mining 
companies.

The Commission recommends that Land Councils - as statutory bodies with functions and 
responsibilities conferred under Commonwealth legislation - be funded to undertake their 
functions/responsibilities (including identifying traditional owners of Aboriginal land and pursuing 
land claims) from the Commonwealth Budget.

Since the Australian taxpayer would then be paying for the administration of the Land Councils on 
top of the royalty equivalents, the Commission considers that the NT Government, which receives 
the mineral royalties and gains most from mining, should shoulder some of the burden by funding a 
proportion of the royalty equivalents. The split as between the Commonwealth and NT 
Government's could be negotiated in the context of the Commonwealth Grants Commission 
process.

*What is the Commission seeking to achieve?*

The Commission has not sought to question Commonwealth Government policy regarding 
Aboriginal land rights. It does seek to make the operation of exploration and mining on Aboriginal 
land under that system more efficient.

The granting of land rights and the power to deny access to such land (considered necessary to 
maintain the integrity of land rights) provides traditional Aboriginal owners with what effectively 
amounts to *de facto* control over any minerals associated with their land. In these circumstances, 
formal retention of Crown ownership of minerals creates a fundamental problem - the property
rights over the mineral resources on Aboriginal land are ill-defined (because of the potential clash between the exercise of *de facto* and *de jure* rights). As formal owner of the minerals, the NT Government expects to receive an appropriate share of any economic rent generated by mining projects in the Territory (including mines located on Aboriginal land). However, the right to say no to mining projects on their land means that traditional owners are in a position to extract some proportion of the economic rent from any mine established on their land. This has led to the current situation where the mining company pays royalties on the minerals mined to the NT Government (excepting uranium), and the Commonwealth pays an amount equal to those royalties into the Aboriginals Benefit Trust Account. (However, as discussed above, traditional owners currently receive only 30 per cent of these payments and this provides them with a substantially smaller incentive to agree to mining than if, for example, all royalty equivalents accrued to them as owners of the land.)

The Commission considers that the NT and Commonwealth Governments should investigate transferral of mineral rights on Aboriginal land to the traditional owners. The Commission sees granting traditional owners *de jure* rights to any minerals found on their land as a possible solution to a great many of the problems currently being experienced as a direct result of ill-defined property rights.

The Commission's approach in this area is aimed at increasing efficiency by moving towards a system of better-defined property rights. Of course, should traditional owners be given *de jure* rights over minerals, many of the Commission's recommendations in this area would become redundant.

**Different arrangements would also improve the situation in the States**

Legislative protection of Aboriginal interests in relation to mining varies widely among the States. In South Australia, Aboriginal reserve land has been transferred to an Aboriginal Lands Trust which leases land back to Aboriginal communities at nominal rates for 99 year (repeatedly renewable) terms. In addition, freehold title has been granted to Aboriginal people in respect of the Pitjantjatjara and Maralinga lands due to "the strong traditional and emotional relationship inhabitants had with the area". In New South Wales, land transfer of title to Aboriginal Land Councils under the *Land Rights Act 1983* includes title to any minerals (except gold, silver, coal and petroleum), unless prior mining authorities or licences exist. However, because the area of Aboriginal land in the State is so small (0.06 per cent), conflict between Aboriginal people and mining interests over land rights has not been a major issue. In Queensland and Western Australia, Aborigines hold only leasehold title (99 and 50 years respectively) and therefore, according to ATSIC, have no special control over mining. Tasmania has no plans to introduce Aboriginal land rights legislation. About 400 hectares of land at Jervis Bay in the Australian Capital Territory was granted to the local Aboriginal community in 1987 under the *Aboriginal Land Grant (Jervis Bay Territory) Act 1986*. (A more detailed discussion is at Section 4 of Volume 3.)

In response to its Draft Report, the Commission received some evidence with respect to the various State situations. Again, there was general agreement by all parties that there are problems with the existing arrangements.
The general view, with some exceptions, expressed by the mining industry was that Aborigines should be treated the same as other Australians and not have a veto over exploration or mining.

The main concerns of Aboriginal people concerned poorly defined property rights and lack of clear negotiating processes. Particular concerns have been expressed at the situation in Queensland and Western Australia.

The Queensland State Office of ATSIC submitted (sub. 91, p.2) that:

Queensland has been slow to recognise traditional rights to land and has largely relegated Aborigines and Islanders to the back blocks. Most of the Queensland legislation currently in place does little to acknowledge any cultural differences. Consultation, participation in land use decisions, lack of land rights, insecurity of tenure and no provision for royalty payments are very real concerns of Queensland Aborigines and Islanders.

The Tharpuntoo Legal Service Aboriginal Corporation concluded (sub. 188, pp.12-3) that:

It is becoming clear that the adversary stance taken by most Aboriginal groups in Cape York is a result of severe asymmetries in power and in access to resources in negotiation. Paradoxically a stronger bargaining position for Aboriginal traditional owners may well lead to a more positive stance and a greater willingness to accept mining or development. ... The issue is not more or less mining but Aboriginal consent to mine and degree of control over the impacts of mining.

The Aboriginal Legal Service of WA believes (Transcript, p.1995) that:

... if Aboriginal people have the opportunity of information and being able to enter into agreements on an equity basis that on the basis of having that capacity of saying yes or no, that generally speaking Aboriginal people have demonstrated that they are not opposed to mining development or commercial development generally.

The Commission's view and conclusions on the situation in the States

Aborigines generally have a special relationship with the land and strongly desire to control access to their traditional lands. Lack of such control in some States, combined with the absence of a suitable framework for miners and Aborigines to use in their negotiations, appears to be causing unnecessary and lengthy delays (eg before companies know whether they will be permitted access to certain areas).

Common themes run through various submissions regarding Aboriginal property rights in the States:

- Aborigines are generally not opposed to exploration and mining *per se* - but they are opposed to not being in control of what happens on and to their land (or what they regard as their land);
• there is an agreed need to have the ground rules regarding access to land clearly established (eg via enactment of a transparent process of negotiation).

The Commission believes that if the property rights of the various parties were more clearly defined, this would lead to a more efficient interaction between Aborigines and the mining industry generally. In turn, this could be expected to lead to the more efficient development of the mining and minerals processing industries.
3 EXPLORATION

Exploration is the first stage in the mining and minerals processing progression, and one which is crucial to the continued existence of the industry over the longer term. Important areas of government intervention in exploration include rules governing access to land, the allocation of exploration rights, direct government participation in exploration and support services, regulations aimed at mitigating any potentially adverse environmental impacts of exploration, and how exploration activities are treated for tax purposes. The discussion in this chapter suggests that substantial gains could be realised from improved government policies in all these areas.

Exploration consists of a sequence of information-gathering steps. This provides the opportunity for decisions to be made at the end of each step about whether or not to proceed. Such decisions will involve weighing up the estimated costs of undertaking the next step (with previous steps now representing ‘sunk costs’) versus assessments of the likely gains. The latter will depend in large measure on how encouraging results have been to date, including how supportive they are of various maintained hypotheses about possible mineralisation in the target area.

In the primary exploration stage, prospective areas of land are subjected to a range of tests, progressing from broad reconnaissance work to more focused and detailed surface exploration and eventually to the drilling of targets. If a promising mineral occurrence is discovered, the second stage of exploration is to delineate or ‘prove up’ the resource. This involves taking systematic samples by drilling or trenching in order to estimate the size, grade, and physical characteristics of the discovery. If the characteristics of the delineated deposit provide justification for mine development, the end result of mineral exploration is an economic mineral deposit. (Various aspects of exploration are detailed more fully in Appendix D of Volume 2.)

Only a very small proportion of exploration programs will ever culminate in a mine being developed. Moreover, as noted by the Victorian Chamber of Mines (sub. 21, p.11) "this achievement will occupy not less than two or three years, but more usually 5 to 15 years and cost the explorer at least several million and up to $30 million or more." In the words of Mackenzie and Bilodeau (1984):

The mining cycle starts at the exploration stage, where there is not only a long period of investment but also a high risk of total loss through failure to discover an economic deposit. Since economic mineral deposits are found by exploration, and depleted in the course of production, investment in exploration ultimately determines the scale of the mining sector. Minerals can only be produced and mining income generated if exploration is successful.

\[1\] Sunk costs are costs which cannot be recouped after they have been incurred (eg by selling an asset thereby created or acquired).
As an activity, exploration is often likened to research and development as conventionally understood in the context, say, of manufacturing. Indeed, the Normandy Poseidon Group (sub. 11, p.2) claimed that "mineral industry exploration is research, just as much as any other industry research and development program."

Decisions at each stage of the exploration sequence as to whether or not to proceed are based on accumulated intelligence and changing perceptions of cost, risk, and return. However, judgments about what exploration expenditures are justified at any point turn not only on available geoscientific information and prevailing and expected market conditions, but also on current government policies (and guesses of what policies will be pursued by future governments).

Of particular interest to this inquiry is the extent to which the actions of governments in Australia serve to promote exploration decisions which are in the national interest. For example, are present processes for gaining access to land (Crown, private, Aboriginal, national parks etc) appropriate? Does exploration - as distinct from mining - damage the environment? How should exploration permits be allocated and what conditions should attach to them? Is there a role for government in the provision of geoscientific information? How should exploration be treated under the taxation system? This chapter seeks to answer these and related questions.

3.1 What factors influence exploration costs?

Green (1990) has estimated that high transport costs, a harsh climate, and (in respect of most of the continent) a very weathered terrain mean that, on average, it costs four times more to find a base metal deposit in Australia than in Canada (one of our major competitors). Offsetting this disadvantage to some extent is the relatively unexplored and prospective nature of much of the country. In addition, CRA Ltd suggested (CRA, sub. 73, p.23) that "Australia is acknowledged as a leader in exploration technique and technology and CRA ... currently has the world's largest exploration budget."

This means that, in general, extra exploration activity (and expenditures) must be undertaken in Australia in the hope of finding a high-quality deposit than is often the case elsewhere. However, Mackenzie and Bilodeau (1984) also found that, due to the skewed nature of the distribution, only 20 per cent of Australia's economic deposits are above average grade, which makes for added difficulty in finding deposits which are "among the best in the world." Many countries are claimed to have greater geological potential (for example, Zaire's copper deposits are well over 100 per cent higher grade than Australia's). Yet despite this, Australia accounts for a large proportion of world exploration expenditure. CRA stated (sub. 73, p.23) that, in 1982, more money was spent on exploration in Australia than any other country, and from 1983 to 1987, the only country with higher expenditure was Canada. Crowson (1983) calculated that, in the early 1980s, Australia accounted for 16 per cent of world exploration expenditure.

If, in comparison with competitor countries, exploration in Australia is a difficult, uncertain and expensive activity, why is so much of the world's exploration budget spent here? Relatively favourable government policies remain as a decisive factor in determining the amount of mineral exploration undertaken here. However, a number of participants (eg Western Mining Corporation (WMC) and CRA) suggested that Australia was in danger of losing any advantage it might have in this regard, particularly in view of recent government decisions which have effectively denied explorers access to many parts of the continent (eg the Kakadu Conservation Zone - see Section 21 of Volume 3).
3.2 Are existing arrangements governing access to land for exploration purposes satisfactory?

What are the present processes for gaining access to land for exploration purposes? Should the mining industry be given 'reasonable' access to land for exploration purposes? What would constitute reasonable access? For example, should exploration be allowed in national parks?

What are the present processes for gaining access to land for exploration purposes?

Section 12 of Volume 3 spells out in some detail the procedures which potential explorers or miners are required to follow in order to gain access to land. While the legal framework differs somewhat among the States and Territories, some generalisations can be made.

Where an explorer/prospector desires access to unoccupied Crown land, the main considerations in determining whether or not an exploration lease will be granted relate to the existence of conflicting public uses of the land, such as for forestry or national parks. With some exceptions, exploration and mining are generally prohibited in national parks - or only allowed subject to approval by both Houses of Parliament of the relevant legislature. Some indication of the nature of present restrictions applying to national parks, nature reserves and similar land in Australia is given in Attachment 6A of Volume 3. Even where exploration or mining is possible in theory in these areas, political realities suggest that, in practice, this is likely to be a rare event.

In the case of occupied Crown land or private land, exploration/mining leases may be granted provided that agreement has been reached between the explorer/miner and the current occupier for compensation for any damage caused. In the event of a disagreement on the amount of compensation to be paid, either party can have the issue decided by a court ruling. There are exceptions, however, to the general rule that private landowners have no right of veto over mineral exploration or development on their property. Of most practical relevance are exemptions often accorded to owners of cultivated or otherwise improved land (eg to some agricultural land in Western Australia), and special consent procedures applying to minerals found on Aboriginal land in the Northern Territory granted under the Aboriginal Land Rights (Northern Territory) Act 1976 (Cwth).

Should the mining industry be given 'reasonable' access to land for exploration purposes? What would constitute reasonable access?

These issues drew diametrically opposed views from some inquiry participants.

The general argument advanced by the mining industry was encapsulated by the Geological Society of Australia which stated (sub. 3, p.1):

... valid decisions on land use can only be made if the maximum information on all characteristics of land is available. Thus alienation of land prior to its geological and mineral characteristics being properly investigated, precludes accurate and informed decisions being taken.
Many participants stressed the need for access to land for exploration to be ongoing. For example, WMC (sub. 69, pp.18-9) noted:

It is of critical significance to understand that ground can never be ‘fully explored’. The continued emergence of new technology (both general and specific to exploration), the increased data bank of geological knowledge provided by exploration reporting, together with ongoing research and development of geological concepts provides new target areas for exploration which will result in mineral deposits being defined in areas previously considered devoid of such resources. Further, minerals currently not commercially significant can, as a consequence of scientific advances or because of changes in the value of the mineral, become the focus of discovery in the future.

Participants provided several examples in support of this proposition. These included the discovery of the world-class copper, uranium, and gold deposit at Roxby Downs through innovative exploration technology after years of traditional exploration had failed to find a viable resource. Similarly, in Hellyer in Tasmania, exploration failed to show up anything until a new electromagnetic technique was used which located an orebody. CRA’s recent discovery of the likely world-class ‘Century’ zinc deposit was in an area which had been extensively explored for more than a century.

Conservation groups totally rejected these arguments. For example, the Nature Conservation Council of NSW (sub. 50, p.6) considered that:

The argument used by the mining industry that decisions regarding national park status cannot be made until exploration is conducted to estimate mining potential is totally unacceptable. Short term economic gain must not be confused with long term benefits. Certainly the former should not be selected as the preference rather than the latter. Areas classified as any of the aforementioned [national parks, nature reserves, marine reserves, national estate etc] have a high conservation status and should be considered as part of our national natural heritage and should be preserved at all costs.

The Environment Centre of the NT (sub. 126) claimed that:

The environmental movement is opposed to mineral exploration access to national parks and nature reserves as the right to mine an orebody is often seen as an automatic extension of its discovery. Conflict can be avoided if areas of conservation significance are excluded from mineral and exploration leases.

The Nature Conservation Council of NSW (sub. 50, p.5) also pointed out that national parks, nature reserves and other similar areas are established to ensure: the preservation of genetic diversity; the conservation of plant species and communities; the care, propagation, preservation and conservation of wildlife; the conservation of places of natural and scenic beauty, natural environments and natural phenomena; the provision of places for recreation, inspiration, peace and human replenishment; and the maintenance of undisturbed ecosystems as reference points for scientific study and education. The Council claimed that the values of such areas are self-evident and that such objectives were clearly incompatible with exploration, mining, and mineral processing.
In direct contrast, CRA (sub. 73, p.106) claimed that:

Provided exploration can be carried out in a way which does not adversely affect the conservation values of sensitive areas, there is no reason why exploration should be prohibited in these areas. Of course, companies undertaking such exploration would need to recognise the limitations that might apply to discoveries, including at times a recognition that mining would not be permitted. The banning of exploration in national parks has led to some ridiculous situations. For example, companies are required to switch off instruments when flying over national parks on exploration programmes. This can interrupt genuine geological and scientific research as well as exploration programmes and has no logical justification.

The Queensland Chamber of Mines (sub. 74, pp.20-1) argued that rules relating to access to national parks or reserves should recognise different levels of exploration, some of which (eg reconnaissance involving no surface disturbance) should not require Ministerial approval.

The Commission's view is that the differing costs and benefits of exploration and mining should be recognised when it comes to imposing restrictions on access to areas of significant conservation value, such as national parks. To argue, as did the Nature Conservation Council of NSW, that our national heritage should be protected at all costs is to argue against informed decisions being made. To argue that exploration should not be allowed because mining may follow is to argue that society cannot make rational decisions.

Given the varied nature of exploration (including the fact that some exploration activities can be carried out without disturbing the land at all), and the clear need for information on which to base informed decisions, the Commission accepts the need to give the mining industry reasonable access to land for exploration. In putting this principle into practice, the definition of what is 'reasonable' should be whether the expected benefits (in terms of the value of the information gained) outweigh the expected costs of exploration (to society as a whole). Important factors influencing this assessment include: the likely costs of environmental damage caused by exploration (which will clearly be conditioned by the environmental value of the land and the nature of the exploration activity proposed); and the likelihood of mining being permitted if an economic mineral deposit is discovered.

Exploration (as primarily an information-gathering activity) should generally be permitted, subject to appropriate guidelines (which would depend, inter alia on the fragility of the area in question). Importantly, however, this view should not be interpreted as supporting claims that successful exploration should automatically lead to mining. (This issue is taken up further in Chapter 4.)
It should also be emphasized that access to land for exploration should be contingent on the establishment and enforcement of proper guidelines to ensure that the expected costs of environmental disturbances (if any) associated with exploration are offset by the potential gains. This trade-off will vary according to the particular site in question but in can be anticipated that in most cases the permissible level of environmental disturbance should be small because the probability of finding an economic deposit - and thus the expected benefits of exploration - is usually low. (Environmental disturbances could be limited to the permissible level by using some of the mechanisms discussed in Section 7 of Volume 3).

Mining companies may find it expensive to conduct exploration under strict guidelines. This, however, is not necessarily undesirable, for unique and highly valued ecosystems ought be accorded appropriate protection. Such a view was not accepted by Stockdale Prospecting Ltd (Stockdale, sub. 43, p.4) which argued that:

If it is felt that an explorer must 'pay' for access it needs to be clearly understood that the 'price' must bear a reasonable relationship to the prospectivity of the ground. It is absurd to expect an explorer to pay say $2 million in road upgrading when the exploration programme is only $3 million but may be reasonable if the explorer is establishing a $300 million mine. Under this concept payment could be a percentage of exploration expenditure within the reserve. Such an approach would however be strongly resisted by many in the industry on the basis that it was a 'tax' on exploration.

This argument has no economic justification. Liability should be related to the damage (potential or actual), irrespective of the prospectivity of an area. If the expected returns from exploration and mining do not exceed total exploration costs - including the cost of complying with guidelines, posting of performance bonds or the cost of insurance policies etc - exploration should not be undertaken.

3.3 Does exploration harm the environment?

There are intrusive (eg sampling, drilling) and non-intrusive (eg aerial) methods of exploration. Are these different methods recognised in environmental requirements?

The Bureau of Mineral Resources, Geology and Geophysics (BMR, sub. 26, p.4-5) stated that:

A common reason given for excluding exploration from an area such as a national park is that exploration would have an unacceptable impact on the park environment. This is not generally true. Exploration can be carried out under appropriate guidelines in an environmentally responsible manner so that the environmental impact is small and not permanent.

Similarly, Denison Australia Pty Ltd submitted (sub. 22, p.10) that:

Mineral exploration is not a real land use. It is a temporary visitation that in the vast majority of cases leaves negligible and even no evidence of its passage.
Stockdale stated (sub. 43, p.5) that:

Exploration is more an assessment exercise with little in common with the earth moving and industrial activity of a mine site. Generally, exploration will proceed through a series of stages with the ground disturbance gradually increasing, but becoming restricted to a specific small area as mineralisation is discovered and investigated. For the reconnaissance phase, the use of geophysics and satellite imagery combined with rock chip, geochemical or heavy mineral sampling means that environmental disturbance is minimal. Subsequent drilling or trenching may cause some disturbance but is carried out subject to the guidelines specified by the relevant State Department of Mines.

Several participants disputed the claim that exploration did little damage to the environment. The Nature Conservation Council of NSW, for example, submitted (sub. 50, p.3) that landing strips and pads, drilling sites, road access and use of bulldozers often cause extensive and intensive damage to natural ecosystems, flora, fauna, and Aboriginal sites. It cited a number of examples of environmental damage caused by exploration, including damaged creek lines due to the bulldozing of seismic lines at Coongie Lakes on the Cooper River; disruption to bird breeding at the Woolwonga Wildlife Sanctuary in Kakadu National Park by low-flying aircraft; the permanent scarring of Central Australia by a grid of seismic lines; the abandonment of rubbish from exploration sites; and interference with water systems (eg overflow of drilling lubricants). These and other examples of alleged environmental damage caused by exploration are documented in Volume 4, 'Mining and the environment'.

Clearly, exploration can harm the local environment, with the extent of possible damage varying greatly depending on the nature of the exploration activity and the fragility of the area being explored. However, this does not in itself justify banning exploration in certain areas. The real issue is whether the benefits flowing from this activity (in terms of information) outweigh the costs (including any damage to the environment). Other than in exceptional circumstances, the Commission considers that there are likely to be net benefits from allowing exploration.

3.4 What type of mineral rights should governments confer and how should these rights be allocated?

While State and Territory governments generally own and control mineral resources in Australia on behalf of the people they represent (see Chapter 2), they usually confer on others the right to explore for and develop these natural resources - rather than doing so themselves. The types of mineral rights conferred and the way in which these potentially valuable property rights are transferred to others has a fundamental influence on the efficiency with which exploration and mining is carried out in this country.

After outlining existing arrangements, this section looks at other possible rights over minerals and allocation mechanisms which could be considered. The relative merits of various combinations of:

- type of property right over minerals; and
Mineral property right/allocation systems are highly conditional

Typically at present, rights to explore for and/or develop mineral deposits are not transferred outright - rather temporary rights are established (with conditions attached) via the granting of exploration and/or mining leases for specified periods.

Most exploration licences in Australia are granted on the basis of 'First Come First Served' (FCFS). As the name implies, under this system exploration rights over a given area are allocated to whoever applies first. Simultaneous applications may be resolved by ballot or (more usually) by assessing proposed exploration programs (work programs). The holder of an exploration licence normally has priority when applying for mining rights over the same land in the event that valuable mineralisation is discovered. However, conversion of an exploration licence into a mining lease is not automatic and may be subject to compliance with a range of further conditions (eg to ensure that adverse environmental consequences are contained within acceptable limits) - some (or many) of which may not be known in advance.

Thus exploration licences (and mining leases) granted under the FCFS system generally require a number of conditions to be met by the transferee. These usually cover such things as annual rental payments, minimum annual expenditure or work required, a phased relinquishment of land if nothing is found within specified periods, and regular reporting of geological information gathered. It is therefore more accurate to describe allocation mechanisms in general use in the States/Territories as conditional FCFS (or first in time) systems.

Further, current mining laws specify a statutory period for which mineral rights are held. The duration of exploration licences generally ranges from 2 to 10 years, while mining leases are normally valid for 16 to 25 years.

Alternative allocation methods should be considered

The main alternatives to FCFS systems involve allocation of the right to explore and/or mine through some form of bidding process. Under the work program bidding method, exploration rights are put up for tender and awarded to the applicant with the 'preferred' work program. While this method is not particularly common outside petroleum, it has been used occasionally in Australia to allocate mineral rights in respect of one-off releases of prospective land (eg land previously reserved by government for some other purpose or land subject to an exploration or mining lease which has been surrendered by the previous holder).

A further (and obvious) way of allocating mineral rights is to auction them. A form of cash bidding has been used in Australia to allocate off-shore petroleum exploration licences and, arguably, for certain coal leases, but to date cash bidding has not been used to allocate rights to other minerals.
Other allocation procedures could involve using some combination of the above methods for
different categories of rights. One possibility raised as an option in the Draft Report would be to
allocate the right to explore by the FCFS method, but once an economic deposit has been
discovered and delineated, to auction the mining rights - with most of the proceeds going to the
discoverer.

But it is not necessary merely to contemplate allocating existing mineral rights in some other
fashion when canvassing alternatives which may be more efficient than the status quo.
Development of more efficient mining and minerals processing industries in this country may very
well require the allocation of fundamentally different rights than are presently on offer. For
example, minimum work conditions/expenditures and present relinquishment rules could be
relaxed, and the length of tenure of mineral rights increased - which would mean that aspiring
explorers/miners would face very different incentives than is presently the case. Changed
incentives will mean changed behaviour, which may lead to more efficient outcomes from the point
of view of society as a whole.

**How should alternative systems be evaluated?**

Assessments of the relative merits of alternative combinations of type of mineral right and method
of allocation will obviously turn on the criteria used.

Perhaps not surprisingly, most submissions from the mining industry implied that the system
should encourage as much exploration and mining as possible, as quickly as possible. Thus CRA
(sub. 238, p.9 and p.11) argued that:

> Mineral resources have no value until they are discovered and delineated, and therefore the
> major objective of government in this area should be to facilitate the discovery of those
> resources. ... CRA believes that it is in the interests of the owner of the resource (ie
governments) to determine as quickly and cheaply as possible what resources are owned.

Unfortunately, the objectives of maximum speed and minimum cost are likely to be incompatible.
For example, one way in which governments could find out as quickly as possible what resources
they owned would be for them to plough millions of dollars into the exploration industry. Few in
the community would support such an all-out quest. The reason, of course, is that exploration is an
expensive activity to undertake and one that is simultaneously inherently risky. Indeed, CRA itself
observed (sub. 238, p.9) that "mineral exploration, if taken in its entirety, is an unsatisfactory
investment, viewed on average economic returns." The fact that, viewed as an activity in its own
right, exploration appears to be a 'negative-sum game' (at least as currently carried out) makes it all
the more vital that explorers face appropriate incentives (ie ones which encourage them to
undertake their activities in as cost-effective a manner as possible).

The upshot of this is that while it is certainly true that "the greater the exploration effort, the sooner
it [the discovery of an economic deposit] will happen", the point is that much of such an
accelerated exploration effort, while hopefully adding to the gross value of known mineral stocks,
would likely reduce their net worth (because of higher-than-necessary search costs).² It is value

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² These would arise from unsuccessful programs - many of which would turn out to have been ill-conceived
because of the magnitude of the effort being mounted in a relatively short period - as well as excess
expenditures incurred by successful programs (eg unnecessary delineation work when it has already been
added, not gross value, which is the proper measure of the contribution an activity makes to the economic welfare of the community.3 In the case of mineral deposits, the proper objective of the mineral property right system should be to maximise potential mineral rents - not only at a particular point in time, but over time as well - where mineral rent is defined as the difference between the revenue received from the sale of minerals and the costs (including those of discovery) incurred in earning that revenue. While the Commission is primarily interested in systems which promote the most efficient use of mineral resources in the above sense (ie one which maximises potential rents - both at any point and over time), it is also concerned with mechanisms (such as the imposition of royalties) by which the community can secure an appropriate return from assigning to others the right to exploit mineral wealth which is the birthright of all Australians.

What type of mineral rights should governments confer?

The nature of rights to minerals granted by governments plays an important role in shaping the overall structure of incentives facing explorers and miners. Key aspects of mineral rights which fundamentally affect decisions explorers/miners make about how they will go about their activities include:

• the exact nature and extent of any conditions attaching to them;

• the security with which they are held (including the extent to which all conditions are known in advance or may be changed by governments in unanticipated ways - referred to as the problem of sovereign risk);

• the length of tenure of the rights; and

• their tradeability.

Each of these aspects can affect resource-use decisions, and therefore the efficiency with which Australia's mineral resources are discovered and developed. (Attachment 2A of Volume 3 presents a general discussion of how the nature of property rights impacts upon the efficiency with which economic activity is carried out.)

*Attaching conditions to mineral rights devalues their worth*

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3 The value added by exploration (a measure of the net contribution of this activity to the overall value of goods and services produced in an economy) is equal to the value of the resulting discoveries (ie economic mineral deposits found) after deducting all exploration and other costs involved in their discovery.
Clearly, mining cannot take place without exploration activity to discover the necessary deposits. This appears to underlie suggestions by many participants in this inquiry for the granting of mineral rights which require immediate activity upon a lease, so as to generate valuable information about mineralisation in Australia (in the case of exploration) or mineral revenue as soon as possible (in the case of mining).

The first point that should be made is that quickest does not necessarily equate with most efficient. For example, BHP pointed out (sub. 223) that:

It is ... very difficult to determine when it is most efficient to commence exploration as relevant factors such as commodity prices, technological innovations and the generation of important conceptual ideas are usually unpredictable.

Minimum work conditions attaching to exploration rights have the effect of mandating investments whose magnitude and/or timing may not turn out to be the most desirable for all sorts of reasons (eg because unjustified as a result of changing circumstances). The Tasmanian Department of Resources and Energy complained (sub. 242, p.4) that "it is Tasmania's experience that some companies do not diligently exploit the right [to explore] unless additional pressure is applied." The fact that companies can be reluctant to comply with work program conditions unless forced to suggests that prescriptive work conditions can be inappropriate and therefore inefficient. However, companies may feel that they nevertheless should comply, lest they suffer a future penalty in terms of access to land - even though they may judge further exploration expenditures to be a complete waste of money. Commenting on the general problem posed by expenditure commitments, Stockdale noted (sub. 43, pp.1-2) that because of its need to cover large tracts of land during "reconnaissance" exploration:

We find that the rate of expenditure necessary to meet title commitments in a number of States greater than we can justify, forcing us to explore on a 'free range' basis. This has the effect of increasing our risk ... and means that many of our results ... are not reported to the relevant Mines Department.

Similar considerations apply to mining rights, particularly conditions (or government expectations) about the timing of mining developments. A system which encourages investment prior to the most desirable time will lead to inefficient development. Existing short-tenure exploration and mining rights would appear to be unsatisfactory from this point of view, as Oakbridge Ltd (Oakbridge, sub. 190, p.1) indicated:

The economic rent available from a project can be critically dependent on the timing of its development: pressures from governments or requirements under mining titles for early development should therefore, to the extent possible, be removed. The Ensham saga in Queensland appears to be a classic case of a project of immense potential for the late 1990s being converted into a very marginal project by premature development.

Encumbering mineral rights with performance conditions is an example of governments trying to impose their priorities on exploration/mining companies. Numerous studies exist which question the effectiveness with which governments run businesses (eg IAC 1989). In the Commission's view, the difference between prospective revenues from minerals and the costs which have to be incurred in earning those returns will be maximised, both in the short run and over the longer term, if decisions about exploration and mining are left to those with the biggest stake in the outcome, namely the explorers/miners who are placing their money at risk. The Commission finds it hard to
reconcile industry concerns about any role for governments/bureaucrats in economic decision-making in other contexts (eg when governments undertake exploration, or when bureaucrats are left to decide areas in respect of which mineral rights should be auctioned) with its apparent acceptance of a large role for the public sector in determining when and to what extent companies should undertake exploration or mining.

Ideally, then, the system should confer rights over minerals which provide incentives for miners to behave as if they owned the deposits they seek to discover and develop, unencumbered by conditions which effectively dictate how or when such resources, once discovered, should be mined. By analogy, it is hard to imagine governments telling farmers which field to plough or when to plough it.

Of course, no property right is completely unconditional, but unless exercising rights over one's property interferes with the rights of others - for example the rights of landholders who make their living from exercising surface rights which will be disturbed by mining, or the right of the community to a habitable environment - mineral rights should be weighed down by as few conditions as possible.

Insecurity of tenure is a serious impediment which must be addressed

Insecure rights over property will affect decisions about how best to utilise assets. Inefficient outcomes in terms of maximising the net value of the asset over the longer term will be the inevitable result. A commonplace example is the different attitudes tenants and owner-occupiers have towards housing - with the latter far more likely to behave in a manner likely to maximise the efficiency with which housing services are provided over the long term.

What has been made abundantly clear during the course of this inquiry is that just how secure mineral rights are from governments subsequently changing the rules mid-project (ie the issue of sovereign risk) is fundamental from an efficiency perspective. Particular areas where sovereign risk looms large are government-induced uncertainties about the likelihood of being able to convert a right to explore into a right to mine, and unexpected changes in royalty arrangements during the course of a mining project.

Linking the right to mine to the right to explore should not be automatic

Many participants in this inquiry stressed the importance, in terms of the incentives to undertake risky and expensive exploration, of linking the right to mine with the right to explore. While explorers are afforded a presumption of priority rights to mining ahead of others under current arrangements, separate approval is usually required and this is subject to compliance with conditions specified by governments. Participants complained that some of these conditions - perhaps culminating in outright rejection of mining - only become apparent at a very late stage in the process.

While it will rarely be possible to fully specify in advance all conditions and restrictions which will apply to any mining phase (if only because the nature of the project - and therefore its likely repercussions for others - will depend on what is found), there would appear to be considerable scope for dramatically reducing current uncertainty engendered by governments imposing conditions which were not known beforehand. In the words of Placer Pacific Ltd (sub. 216, p.7):
... the discoverer of a resource should be given the right to mine that resource subject to pre-existing conditions regarding environmental protection and compensation to landowners.

Taking this idea further, Oakbridge suggested (sub. 190, p.1), in the context of considering the ideal type of mineral right, that:

... a mining tenement ought to provide the right to mine. Supplementary approvals ought not be needed except insofar as to confirm that published prescribed standards are satisfied. Similarly ... areas within a mining tenement where mining is to be prohibited or restricted should be defined when the tenement is granted. ... This suggests [the need for] rights which are either unconditional or, in respect of which, all conditions are fully specified (avoiding administratively lazy formulations such as "and any other conditions directed"). Should a government in the future need to alter a condition, the opportunity for alterations should be limited - at the very most - to changes in engineering, safety and environmental standards or similar conditions that apply across the board to all enterprises in the jurisdiction concerned, and the question of compensation should also arise.

Royalties can be an important element of the allocation system

Royalties are charges levied by governments in return for transferring the right to exploit publicly owned mineral resources to others. The value of rights to any minerals discovered in a particular area will clearly be less than would otherwise be the case if the company to which the rights have been transferred knows that royalties (the exact nature of which is known in advance) will apply in the event that an economic mineral deposit is discovered.

But it would be virtually impossible to place any sort of a figure on the value of mineral rights in circumstances where it is not known in advance whether governments will or will not intervene to vary royalty arrangements in the event that an economic deposit is found. The added uncertainty engendered by such a situation is hardly conducive to the efficient development of mining in this country. Miners and mineral processors have enough to contend with in the way of uncertainty without governments adding unnecessarily to their problems in this regard. Pre-specified and well-defined royalty arrangements which automatically guarantee that the community gets a 'fair' return when others exploit Australia's mineral wealth - even in the case of mines which turn out to be 'bonanzas' - can be devised (see Chapter 6) so that governments should not even feel tempted to intervene in unanticipated ways during the life of a mining project.

Sovereign risk must be minimised

Although there is always the potential for the rules to change regardless of what system of allocation and property rights are in effect, certain arrangements are less susceptible to change than are others. For example, the Australian Mining Industry Council (AMIC, sub. 229, p.11) stated:

The problem of sovereign risk highlights the need for clear definition of mineral property rights. The more clearly defined and strong is the property right, the less subject it is to sovereign risk. In this respect, what is needed is something like the freehold title provided for rights to use the land surface: a well defined title which Australian governments typically are reluctant to infringe.
In the absence of the equivalent of freehold rights being granted for minerals, improved predictability and security of tenure could be provided by more widespread use of:

- State Agreements (embodied in Acts of parliament); or
- legally enforceable contracts (which should be less subject to change by government without the consent of the other party).

More to the point, sovereign risk is less likely to be a problem when the financial arrangements struck between governments and mining companies are sufficiently flexible to reward public revenue fairly as circumstances change. Governments must realise and accept that if their actions heighten perceptions of sovereign risk, everyone will lose, including governments, the community and explorers/miners (who may well respond by taking their knowledge and expertise to other parts of the world where the rules are known in advance and adhered to - or at least where they judge sovereign risk to be not as great).

Length of tenure of mineral rights is a crucial determinant of their worth

The length of tenure of property rights is another important determinant of the way such rights are likely to be exercised.

Besides being of short tenure, existing exploration rights usually provide for regular relinquishment of part of the lease. This places explorers in a double bind, further encouraging what - if there were time for considered reflection - would likely be judged to be ill-conceived and precipitate exploration activity. It must be the case that the approach of each 'relinquishment day', apart from causing exploration managers and key decision-makers within companies some sleepless nights, signals the need for something of a last minute flurry of activity as some form of exploration work is done on ground 'just in case' - exploration activity which would not otherwise have been undertaken. That such incentives exist is supported by the observation that, statistically speaking, it is something like the eighth explorer of a particular piece of ground who finds something of value.

A further adverse effect of current relinquishment rules is that, over time, their application can reduce the average size of available leases to inefficient sizes (particularly for exploration purposes), as well as creating odd-shaped blocks becoming available for further exploration.

Tradeability of mineral rights is also important

Being able to freely buy and sell property rights is fundamental to the efficient management of valuable assets, since markets provide efficient and transparent mechanisms for transferring ownership of assets (in this case rights to exploit minerals) to those who value them most. Accordingly, there should be no requirement, as at present, to gain government approval to transfer mineral rights to others.
Possible problems with the type of mineral rights being advocated need to be anticipated and addressed

Participants raised a number of potential problems with property rights over minerals of the type discussed above and advocated in the Draft Report. Two important ones were potential externality problems and the danger of ‘real estating’.

‘Externalities’ are a potential problem

Several participants argued against the granting of long-tenure mineral rights on the basis that too little exploration (from society's point of view) will take place if it is left entirely up to private firms - because some of the benefits of exploring will not be able to be captured by the explorer. This is because information gained by exploring one area may provide clues about mineralisation in other areas not covered by the exploration tenement. Thus, AMIC argued that exploration rights must be supported by relinquishment and reporting conditions which recognise the public good aspects of the information generated by exploration.

Having further considered this matter, the Commission is not convinced that the existence (but more particularly the likely extent) of such information externalities justifies the imposition of compulsory disclosure conditions on exploration rights. First, much of the exploration activity which is most likely to yield information of wider interest - such as basic geological mapping functions - is already undertaken by government agencies (see section 3.5). Second, it is not at all clear that much of the value of any information of relevance to areas outside the lease area could not be fairly easily internalised (eg captured through private market transactions). Indeed, the requirement to provide - at no cost - all exploration results to government upon surrender of land is a mechanism which effectively expropriates from explorers information of potential value to others. Such expropriation arguably acts as a much greater disincentive to exploration than offering long-tenure exploration rights - yet the industry seems quite reconciled to compulsory disclosure rules (perhaps because those who intend to be long-term players in the exploration game stand to gain cumulatively over time valuable information about the geology of Australia at no cost)4

‘Real estating’ would only be a transitory problem, at worst

Several participants argued against granting unconditional mineral rights on the basis that such rights could be acquired by ‘real estaters' (ie speculators hoping to gain from holding a valuable property right by subsequently selling it for a profit, rather than actually exercising the mineral rights themselves). Such an objection might be sustainable if valuable mineral rights (eg long-term unconditional ones) were given away free (eg allocated on a FCFS basis) - although even here only the lucky initial recipient is likely to make a big killing, with all subsequent dealings in the property right reflecting individual judgments of the net worth of actually exercising the mineral rights. However, allocating such rights on a FCFS basis is not what the Commission has in mind (see below), although the question of allocation is (or should be) irrelevant to the efficiency gains involved in moving to a type of mineral right designed to realise such gains. The other point to

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4 This is analogous to the ‘free rider’ problem in acquiring exploration results which the industry raised as a fundamental objection to the Commission’s suggestion that mineral exploitation rights should be auctioned after discovery.
make in this context is that the act of abstaining from actually exercising mineral rights because, for example, the (real) value of such rights is rising is exactly what society should applaud, since it is in the interests of those with a stake in the outcome (eg via royalties) to maximise the net worth of any particular asset. Thus ‘real estating’ can be highly desirable in the right circumstances.

To sum up the preceding discussion:

In order for the community to reap maximum benefit from publicly owned mineral resources, it is of fundamental importance that exploration rights be allocated in such manner and subject to such conditions as permit those with the best information and expertise to acquire and exercise those rights.

More secure and less restrictive mineral rights would be much more valuable to those to whom such rights are transferred than is the case with existing exploration and mining rights. And more valuable rights from the point of view of the transference would be more conducive to the community receiving an appropriate return for allowing others to exploit what are publicly owned non-renewable natural assets (because holders of such valuable rights will acknowledge their worth by striving to exercise them in the most efficient manner possible).

The Commission favours the allocation of long-tenure, freely tradeable mineral rights subject only to limited and well-defined conditions, because they would provide the most appropriate incentives for the efficient conduct of exploration and mining (and thus the maximisation of Australians' mineral wealth).

**How should mineral rights be allocated?**

The method by which mineral rights are transferred from public to private hands can have both efficiency and equity implications, with the latter depending importantly on the type of property right being allocated. When viewed from these twin perspectives, the most appropriate method of allocating the relatively unconditional rights advocated above may well differ from that for allocating existing, more restrictive exploration/mining rights. The question is which combination of mineral property right and allocation mechanism is most likely to promote the maximisation of the value of Australia's mineral wealth, bearing in mind that the allocation mechanism should be capable of appropriating a 'fair' return for the community as owner of that (admittedly indeterminate) wealth. While the central concern of this section is to address the best way of allocating the long-tenure, freely tradeable mineral rights (subject to limited and well-defined conditions) advocated by the Commission in the previous section, the question of how best to allocate other types of mineral rights (eg existing short-tenure, conditional exploration and mining rights) is also discussed.

Allocation methods which are difficult to evaluate (let alone justify) from either an efficiency or equity perspective include totally subjective ones in which little is known about the exact basis on which mineral rights are allocated. In this respect Oakbridge drew the Commission's attention to the situation of coal in NSW when it observed (sub. 190, p.2) that most coal rights in NSW are allocated by Ministerial discretion, speculating that all kinds of extraneous considerations can be involved in such decisions - such as the fact that the existing operator of an adjacent block already has a 'fair' share of resources in a particular district. If true, this is a rather alarming situation which is difficult to imagine the citizens of NSW tolerating.
First come first served systems have their problems

Allocating short-tenure mineral exploration rights which are contingent on satisfactory 'performance' on a FCFS basis appears to reflect a desire by governments to promote early and rapid mineral exploration and, where discoveries are made, the prompt exploitation of those resources. Mining interests favour this allocation mechanism because it provides relatively low-cost access to land and holds out to explorers a good prospect of reaping the reward for risk-taking by providing them with a first claim on mining rights.

The imperative to acquire rights over land which is considered at all prospective before somebody else does, combined with the fact that such rights can only be held for a relatively short time unless a discovery is made, provides incentives for exploration companies to acquire tenements and to conduct exploration as soon as the expected net returns from exploring are judged to be even marginally positive. AMIC presented evidence that the return on mining investment is no better than the average across industry generally, because many (highly) profitable projects are necessary to offset the many unsuccessful exploration programs. While industry-wide returns may only be 'average', the variability at the level of individual companies is quite high, ranging down from the successful mining houses to the multitude of failed prospectors trying to put together enough money to test their latest theory. Thus from the viewpoint of surviving companies the FCFS allocation system has not frittered away the potential rents available, but from the community's viewpoint this relatively low-cost access system encourages 'every man and his dog' to scour the ground on the off chance that they will stumble upon the equivalent of Lassiter's lost reef. The result is that too many resources are spent looking for what are relatively few viable deposits.

Although not as obvious as the 'gold rushes' there is, in effect, a nation-wide rush to acquire exploration rights over prospective land under a FCFS system of allocating mineral rights. AMIC admitted that rent dissipation could occur in highly prospective areas but emphasised (sub. 29, p.80) that competition for mineral exploration leases was the exception rather than the rule and "therefore, a priority allocation method may not result in a substantial dissipation of rent." In response to AMIC's claim, the Association of Mining and Exploration Companies (sub. 198, p.13) argued that:

It is not true to say that there is limited competition for ground. ... If this comment is confined to the first entrant to an area, then in today's economic environment it may be true, although once one company has entered an area others will tend to follow immediately and a pegging rush can ensue under some circumstances. The comment [that there is limited competition for ground] is certainly not accurate when viewed historically. For example, five years ago there was intense competition amongst the exploration and mining industry to obtain tenements over ground the subject of old gold mining activity. Competition was then the rule rather than the exception and the thousands of contested Warden's Court cases in Western Australia over the past five years bear witness to this.
It seems readily accepted by the industry that rent dissipation can occur as a result of over-zealous exploration activity where there is jockeying for prospective land. Such competition has occurred more often in Australian history than is generally supposed.

However, the Commission's concerns about the potential for FCFS systems to dissipate mineral rents (which could otherwise accrue to the community) goes beyond encouraging wasteful competition for particular leases.

FCFS systems also encourage inefficient exploration of whole tracts of land. For example, imagine an area of land on which explorers confidently expected to discover valuable mineralisation. If that area of land were divided into several tenements, and these were available for allocation on a FCFS basis, then not only would all the leases be likely to be acquired (because of the land's prospectivity) but it could be expected that exploration would be carried out on each and every one of them until the deposit was found. The point here is that a good deal of exploration activity could be expected to be carried out before the deposit was discovered. Contrast this scenario with the situation in which the entire area comprised one large tenement. Then intuition suggests that, given sufficient time, a single explorer with exploration rights over the whole area could be expected to find the deposit, on average, by devoting far fewer resources to the search than in the former case (where the whole area was being explored simultaneously by several explorers).

Much of the preceding discussion of FCFS allocation systems has tended to revert to a criticism (on economic efficiency grounds) of the restricted nature of the mineral rights which are usually allocated by this method (see later for a discussion of how best to allocate the type of mineral rights the Commission favours).

But if governments in Australian conclude for whatever reasons that it is best to stick with the status quo, allocating such conditional mineral rights by FCFS is probably as good a method as any, since the value of such encumbered rights would be so low in the vast majority of cases (eg over land which is not considered to be very prospective) that it may not be worth incurring the administrative costs involved in switching to some other system. In the case of highly prospective land (or land for which there is more than one applicant under a first in time system) it may be worth considering other methods of allocating what are clearly regarded as mineral rights of some value (eg auctioning them to the highest bidder).

Work program bidding has little to commend it

Allocating mineral rights on the basis of work program bidding involves governments awarding what are usually even more conditional rights of access to an area than those typically allocated on a FCFS basis, based on the advice of bureaucrats as to which 'bid' is to be preferred - where 'bids' take the form of undertakings to carry out a pre-specified exploration program (or to outlay a specified amount on exploration). As well as suffering from the disadvantages already discussed above in connection with FCFS allocation systems, allocating exploration rights by work program bidding involves the additional problem that companies keen to acquire exploration rights over a particular area will be encouraged to promise to undertake more extensive and/or expensive exploration programs in order to secure those rights than could otherwise be justified. The result will be that potential economic rents will be dissipated in excessive expenditure on exploration.
The Trades and Labour Council of Western Australia considered (sub. 39, p.11) that under work program bidding "an additional departure from efficiency conditions is generated if we consider that State actions are sometimes influenced by a development perspective, such that a `faster growth is better' belief leads to premature expenditure."

Sovereign risk aspects of work program bidding are also undesirable. EXXON Coal and Minerals Australia Ltd (sub. 58, p.31) acknowledged the potential situation under work program bidding in which:

... a company is unable or unwilling to fulfil its work bid and the government is therefore faced with the decision to either modify the permit conditions or cancel the permit. Ignoring or modifying conditions undermines the credibility of the system as another company with a lesser initial work bid may have fulfilled its obligations and the subsequent acceptance by government of a lesser work program than bid by that company would rightly make it feel cheated. However, the alternative of cancellation is a drastic and unpleasant step which could sour the whole industry/government relationship, depending on the circumstances.

Several participants argued that, even if rent dissipation occurred under a work program bidding system (eg by forcing companies to bring forward programs or to spend more on them than they could otherwise justify), this was at least preferable to spending an equivalent amount bidding for the mineral right because, as put by Stockdale (sub. 43, p.2):

... the industry sees both itself and the public interest best served by the maximum amount being spent 'in the ground' in generating additional geological data which is focussed on the search for economic mineral deposits.

This is an understandable perspective from the point of view of a mining company which, deriving no benefit from allocation systems which involve cash payments to the government, would sooner devote the same funds to exploration. A counter argument is that the statement presumes that 'more is better' - which may well be true from the point of view of explorers, but not necessarily from the point of view of the Australian community. Indeed, from an economy-wide perspective less may very well be better. As argued earlier, a problem with existing combinations of type of mineral right/method of allocation is that too much unsuccessful or unnecessary expenditure may be encouraged - such that the relatively few viable deposits which are discovered only just pay the way for the industry. While the cost of exploration will not be excessive for the relatively few who find an economic deposit (especially if it turns out to be a world-class orebody), it is clearly not in the public interest to have too many resources devoted to exploration in relation to what is discovered. Efficient exploration would maximise the difference between the revenues flowing from exploiting minerals and the cost of their discovery - thereby creating mineral rent which is available to be shared in some way among those contributing to its creation, including society as a whole as owners of the minerals. This gets us back to consideration of the ideal type of mineral rights (already discussed in the preceding section) and how best to allocate them.
Another problem with work program bidding is that there is no one unambiguous criterion for choosing between alternative developers. As noted by the Trades and Labour Council of Western Australia (sub. 39, p.11):

This provides scope for discretion in the assignment of rights and charges of being ‘unfair’. Decisions are subject to distortion in terms of submitted work programs, State objectives and political pressure.

In commenting on the Tasmanian system of allocating exploration rights by work program tender evaluated by a panel of Division of Mines and Mineral Resources personnel, the Tasmanian Chamber of Mines (sub. 221, p.10) contended that:

No matter how hard such a panel tries, it cannot escape the fact that its decisions will be influenced by the technical and exploration competence and experience of its members, and by their particular methodological bias. It is difficult to imagine how a panel, whose members may have had little personal exploration experience or, more importantly, exploration success, and who are possibly unfamiliar with new methodologies, can make comparative judgments on work programs. Such a system can result in a severe hindrance of exploration experimentation.

A system whereby government assesses the relative acceptability of work program bids is clearly an unsatisfactory method of allocating mineral rights and it is difficult for the Commission to accept that it is a method which is readily accepted by the industry. Indeed, the Tasmanian Chamber of Mines suggested (sub. 221, p.10) that the industry is not all that enamoured with the system:

... criticism is, however, often stifled because companies recognise that any open criticism of the system may negatively impact on their chances of acquiring tenements under such a discretionary system based on work programs. Because criticism is so stifled, proponents of the scheme wrongly believe that the system is broadly supported by industry.

Auctioning of mineral rights has much to commend it

In principle, auctioning of long-tenure freely tradeable mineral rights (subject only to limited and well-defined conditions which are known in advance) to the highest bidder should ensure that Australia's mineral wealth is discovered and developed as efficiently as possible, while simultaneously securing on behalf of the owners of that wealth (ie the people of Australia) an appropriate return for transferring what would undoubtedly be valuable property rights to others. The transfer of such rights to minerals discovered in a particular area would leave the developer free to determine the pattern and timing of exploration and any subsequent development. Such a regime is in stark contrast to existing systems, whereby short-tenure and highly conditional exploration/mining rights are allocated on either a FCFS or work program bidding basis.

In submissions and at the hearings on the Draft Report there was almost unanimous opposition to cash bidding on the part of the industry. Many of the objections raised are addressed below in the process of spelling out what the Commission has in mind. However, many participants may have been under the impression that the Commission was advocating cash bidding for the existing types of mineral rights. As discussed earlier, the Commission favours secure, long-term, unconditional and tradeable mineral rights (inclusive of both exploration and mining rights). The industry may
well be right that the auctioning of existing restricted mineral rights is inferior to allocation on the basis of FCFS. But in the case of the more efficient property rights recommended by the Commission, auctioning is, in principle, the most efficient allocation mechanism.

Many participants argued against cash bidding on grounds that this would reduce funds available to finance exploration. In fact, the bid should be regarded as an up-front (or ex ante) component of royalty charges - and would, indeed, constitute the only royalty payment if governments chose not to include a pre-announced royalty regime to apply ex post as one of the conditions attaching to mineral rights over a particular area. (Royalties are discussed in Chapter 6.)

- Uncertainty and sovereign risk remain as problems to be addressed

Many participants considered that cash bidding could not be expected to work in the case of assets of uncertain value - such as unknown mineral deposits - because of lack of hard information on which to sensibly base a bid. A common view was that of CRA which stated (sub. 73, p.30) that:

Before discovery it is virtually impossible to sensibly assign a value to ‘what might be found’ in any particular area. The best that can be said is that a particular area might be prospective on the basis of a particular theory. The risk and uncertainty involved is large ...

CRA (sub. 73, p.30) therefore "believes that low-cost entry to exploration is the appropriate policy to pursue and that any rents should be collected in conditions of greater certainty." But it is easy to make too much of this argument, since, to take a familiar example, buyers and sellers of shares face essentially the same problems of having to cope with uncertainty - yet prices are struck every day based on people's subjective valuations of the worth of these assets (even in the case of shares in exploration companies facing the sorts of dilemmas described). Closer to home, farm-outs implicitly (if not explicitly) place a monetary value on the expected net worth of mineral projects in circumstances characterised by great uncertainty.

A more fundamental objection, or at least one that is capable of being addressed by governments, has to do with how perceptions of sovereign risk will affect the bidding process. If potential bidders for mineral rights believe that governments will subsequently intervene to have a second bite at the cherry by changing royalty arrangements in unanticipated ways - particularly in the case of ‘bonanzas’ - then the rational thing to do is to discount one's bid heavily to cover that eventuality. The result will be disappointingly (but understandably) low bids. AMIC, in noting (sub. 29, pp.80-1) that auctions for areas on which little is known are likely to generate low bids posed the question:

Are governments prepared to accept low bids and be bound subsequently by the results of the auction? A major problem with the outright sale of mineral rights is the potential for 'sovereign risk'. Having sold the mineral rights, governments have a strong financial incentive to subsequently reimpose royalty-type taxes. Governments are not bound by the decisions of past governments. If companies perceive that such behaviour is a significant risk, they will discount their bids for the property rights, thus reducing the effectiveness of the asset sales as a revenue raising mechanism.
To minimise the problem of sovereign risk government should institute charging systems for the right to exploit minerals which reduce the incentive to subsequently change the rules. One way of achieving this is to allocate rights through cash bidding in conjunction with a pre-announced royalty regime to apply to any subsequent development phase. This would reduce reliance on the cash bid as the only source of royalty payment, by allowing the community to share in any subsequent mineral rents that are generated as a result of exercising mineral rights over a particular area (see Chapter 6 for a discussion of what the Commission regards as appropriate royalty arrangements). Such a scheme would also minimise concerns that the community would be disadvantaged by a simple auction if initial bids are too low because of uncertainty about the prospectivity of the area whose mineral rights are to be allocated.

A further restraint on sovereign risk could be provided by making the cash bid automatically refundable to the developer in the event that government subsequently acts to appropriate a greater share of the proceeds of exploiting a mineral deposit (plus, if appropriate, compensation such as could be secured at law for breach of contract).

- Will the market work?

Concern was also expressed that cash bidding would not work for reasons such as the likely 'thinness' of the market (and therefore the possibility for collusive behaviour on the part of bidders), or because governments may try to manipulate prices by adopting carefully calculated release strategies and/or specifying unrealistic reserve prices.

In the Commission's view these types of concerns are largely unwarranted.

Market thinness (and therefore the potential for collusive behaviour) is less likely to be a problem with the type of mineral rights the Commission has in mind to auction than would be the case, for example, with existing mineral rights - because aspiring explorers/miners would recognise them as potentially far more valuable property rights (and therefore much more likely to attract both local and overseas interest). Also, sealed-bid auctions can be used to combat the possibility of bidders indulging in collusive behaviour.

On the issue of strategic behaviour on the part of governments, while the Commission is not particularly convinced that this would represent a problem per se, it is concerned to reduce the opportunity for the exercise of discretion to a minimum. One way of achieving this would be to have the act of somebody applying for an exploration lease over an area automatically triggering an auction for the mineral rights to that area, the details of which - such as the particular area the mineral rights to which are to be auctioned, when and how, but not the name of the person/company whose action has triggered the auction - would be publicly advertised. This would have the additional advantage of all potential bidders going into the auction with common information, in the sense that all would have access to any previous exploration results relevant to the area. Of course, different people may interpret that information differently - especially the party triggering the auction (but that is the case with any auction, as well as being the case with the status quo).
On the issue of reserve prices, the Commission's view is that, while administrative costs of holding auctions should be recovered (eg via charges levied against intending bidders), governments will not be in a position to set realistic reserve prices for mineral rights (because of a lack of information) and should not therefore do so.

In any event, initially auctioning the mineral rights to an area plus the freely tradeable nature of those rights will mean that they will eventually come to be owned by those who value them most. (This would include governments which, if they wish to preserve a particular area whose rights had already been auctioned, could buy back the relevant mineral rights.)

- Will off-site and pre-lease exploration efforts be rewarded?

Another argument raised by many participants was that having to take part in an auction would force companies to bid away all or most of the value of any superior information they had generated about an area, in order to be sure of gaining the mineral rights to it. If so, the conduct of off-site and pre-lease on ground exploration would be discouraged.

In order to counter the possibility of a 'bandwagon' effect developing whereby largely speculative bids were encouraged by the obvious interest of a large mining house in acquiring the mineral rights to a particular area, the auction could be conducted on the basis of sealed bids (already suggested as a way of countering collusive behaviour on the part of potential bidders). Additionally, if governments considered that running a sealed bid auction would still not solve the problem, consideration could be given to setting the amount the winner of the auction actually had to pay equal to the second highest of all bids received.

The Commission's Draft Report contained a suggestion that governments could consider instituting a system whereby once discovered and delineated, the rights to mine an orebody be auctioned - with most of the proceeds going to the discoverer, and a fraction to the Crown as owner of minerals. After receiving much comment on this proposal, the Commission now accepts that it is not a practical alternative, if only because of the difficulty in practice of deciding when to put a discovery up for auction, given the fact that there is often no single and unambiguous point at which a deposit can be declared to have been "discovered and delineated".

- Will small explorers be squeezed out?

Some participants claimed that cash bidding would reduce exploration by squeezing out smaller exploration companies - which have been responsible for many technical innovations and some notable successes in the past. If this is a problem, and cannot be resolved, for example, by forming joint ventures, it is because the capital market assesses these small enterprises inappropriately. However, it is not clear that this is the case in the sense that, although small explorers may have occasional notable successes, they presumably have many failures - so that potential lenders take a balanced view of the risks of lending to smaller explorers. There is also the possibility that, even though it may be more difficult for small explorers to win at auction, their expertise and services could well be in demand by those who do secure the mineral rights. In this respect Denison commented (sub. 238, pp.9-10) that:
In Canada there is a thriving prospecting industry that underpins the supply of new prospects. ... The Canadian prospector will work on an area to the point where its prospectivity becomes a saleable commodity. At this point a larger organization will either purchase the property outright, or enter into an arrangement to fund further exploration and development. ... 

The single most important factor that contributes to the disestablishment of Australian prospectors is that the established Australian companies will not make any up-front payments to Australian prospectors. ... Privately the majors will agree that they could encourage the prospectors and juniors more, but in practice and in public they do not do so.

**Which system of mineral rights and method of allocation does the Commission recommend?**

The preceding discussion of what type of mineral rights the Commission favours and what method of allocation is best can be summarised by reference to Figure 3.1, which illustrates the principal combinations of type of mineral rights versus method of allocation of those rights.

**Figure 3.1: Type of mineral right versus method of allocation**

<table>
<thead>
<tr>
<th>Type of Allocation system</th>
<th>Type of mineral right</th>
<th>Status quo (short-tenure highly conditional)</th>
<th>Favoured alternative (long-tenure, tradeable, minimum conditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCFS (incl work program bidding)</td>
<td>Existing system: inefficient, equity not an issue because of limited value of rights.</td>
<td>Efficient, but equity problem of giving away valuable rights to first applicant.</td>
<td></td>
</tr>
<tr>
<td>Auction</td>
<td>Inefficient: auction would not raise much money because of limited value of rights.</td>
<td>Efficient and equitable</td>
<td></td>
</tr>
</tbody>
</table>

The figure looks at the various combinations from the point of view of both efficiency (with which the Commission is primarily concerned) and equity (which is also of concern from the point of view of how best to secure an appropriate return to the community as owner of mineral resources - an aspect of which is how to design royalty arrangements so as not to undermine the efficiency objective - see Chapter 6).

Looking down the columns of Figure 3.1 - that is, comparing ways of allocating the short-term, highly conditional mineral rights which characterise systems currently on offer by governments in Australia with the long-term, tradeable and unconditional rights favoured by the Commission - from an efficiency perspective the former are not conducive to the efficient development of mineral
resource based industries in this country (while the latter arguably are); while from an equity perspective there is probably not much to choose between FCFS methods of allocating the limited mineral rights which characterise the *status quo* and the alternative of auctioning them off to the highest bidder (because of the limited value of such rights), whereas the equity objective will be served by auctioning what would represent the far more valuable mineral rights favoured by the Commission.

To reiterate, it does not follow that existing allocation methods (eg FCFS and work program bidding) should be used to allocate valuable property rights over minerals of the type advocated by the Commission. In the same vein, nothing much may be gained by auctioning existing, more restrictive mineral rights of the type presently offered by governments in Australia.

To sum up, of the various allocation systems considered:

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**Work program bidding** is demonstrably inferior as a method of allocating exploration rights and is likely to result in significant inefficiencies. The Commission recommends against use of work program bidding systems.

**Therefore:**

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The Commission recommends that long-term (eg 99 year), tradeable mineral rights subject only to limited and well-defined conditions (eg pre-announced royalty arrangements and environmental safeguards) be allocated by competitive cash bidding.

The Commission envisages that such an auction would be triggered automatically whenever a formal application is made for an exploration licence over a particular area. The name of the applicant should not be made public and the auction should be run on the basis of sealed bids.

The Commission supports the option of cash bidding for leases regardless of the amount of information known as this is more efficient than allocating valuable long-term, and tradeable mineral rights to those who walk through the door first.

If governments are not prepared to offer potentially valuable mineral rights of the kind favoured by the Commission, preferring to stick with the more limited mineral rights associated with the *status quo*, the Commission agrees that ‘first come first served’ allocation systems are appropriate where there are poor prospects of significant competition to acquire those rights (eg because there is little prior information about the prospectivity of an area); that existing relinquishment provisions and the requirement for full revelation of exploration results should be retained; but that exploration permits should not be subject to any conditions relating to work which must be carried out.
Finally, the Commission wishes to reiterate its comments about the potential for concern about sovereign risk on the part of bidders to constrain the amount they are prepared to pay at auction for mineral rights. Further, while cash bidding may temper exploration activity in the short term compared to FCFS (but not necessarily over the longer term), the Commission considers that sovereign risk has a more substantial impact on current exploration and mining investment. Besides resort to agreements with mining companies which are embodied in legislation, cash bidding subject to a known pure-rent royalty regime is less likely to result in infringement of the rules by governments. (The latter contention is taken up in Chapter 6.)

3.5 Should governments be involved in exploration?

Exploration is predominantly undertaken by the private sector in Australia. However, government agencies support private explorers by undertaking three principal activities: the collection, analysis and presentation of fundamental geoscientific information in useful forms (such as detailed geological maps); limited on-the-ground exploration; and by publishing or otherwise disseminating the results of relevant research into the geology of Australia. The most important of these activities from the explorer's perspective is the provision of basic geoscientific information. The main government organisations involved in acquisition and dissemination of this type of information are the BMR and the Commonwealth Scientific and Industrial Research Organisation (at the federal level) and State/Territory Mines Departments (or their equivalents).

Currently there is not a large amount of government exploration (in the strict sense of the term) being carried out. However, it is sometimes suggested that if the government were to auction mineral rights, it should obtain information about the likely value of mineral deposits beforehand by undertaking necessary exploration itself.

The mining industry is staunchly opposed to any suggestion that governments get more involved in field work, criticising government exploration efforts on several counts. WMC simply asserted that "government exploration is inefficient", listing several reasons why this could be expected to be the case, namely: such activity is subject to high degrees of political risk; public sector incentives are inadequate; and the public sector is subject to sanctions not imposed in the private sphere. Similarly, the Association of Mining and Exploration Companies argued (sub. 15, p.53) that the government "did not have resources, commercial direction or skills to conduct exploration efficiently."

The WA Department of Resource Development suggested that inefficiencies potentially associated with government involvement in field exploration could be reduced by contracting out such activities, but noted that this would result in the increased monitoring costs. This would be a particular problem where subsequent auctioning of mineral rights was envisaged, as there would be an incentive for contractors not to provide the full results of their activities (since by withholding key results they would be in a better position than their competitors to bid for mining rights).

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5 For the purpose of collecting statistics on this activity, the Australian Bureau of Statistics defines exploration as consisting of "the search for new ore occurrences or undiscovered oil or gas and/or appraisal intended to delineate or greatly extend the limits of known deposits of minerals or oil or gas reservoirs by geological, geophysical, geochemical, drilling and other methods" (ABS 1990f).
The general industry view is that it is not appropriate for governments to be involved in the high-risk preliminary stages of exploration. In the words of the Normandy Poseidon Group (sub. 80, p.3), "government spending should be restricted to the systematic data collection and compilation needed for land-use management and resource allocation decisions."

The Commission considers that the main rationale for government involvement in exploration is that certain exploration-related activities have 'public good' aspects (i.e., private firms are likely to underinvest in them because they cannot capture all the benefits of their investment).

The provision of geoscientific maps and supporting data, and publishing the results of basic geological research fall into this category. Although mainly used for exploration, it is generally not the case that any particular client will be able to capture all (and maybe not even most) of the benefit to be derived from the collection of such information. Such information also has other uses which are unrelated to exploration, such as an input into resource planning and land management.

There does not appear to be any 'public good' justification for governments engaging in field exploration. There is little indication of market failure in this area. Private explorers are generally able to capture most of the benefits of this type of activity. Furthermore, it is a very high-risk activity which should be financed by those willing to bear the risks, not by compulsorily acquired taxes.

The Commission recommends that the Bureau of Mineral Resources, Geology and Geophysics and similar Commonwealth, State and Territory government-owned agencies be restricted to undertaking (or contracting out) the collection and dissemination of basic geoscientific information (e.g., basic mapping functions) and fundamental research on the geology of Australia.

3.6 How should exploration be treated for tax purposes?

Exploration costs necessary to discover mineral deposits are unique to mining (and petroleum) activities and under section 122J of the Income Tax Assessment Act 1936 such outlays are allowed to be fully deducted in the year in which they occur for the purpose of calculating assessable income, rather than being amortised over the estimated life of mines established to exploit the assets these expenditures have 'created'.

Some commentators (e.g., ABARE 1988) treat such claims under 122J as representing assistance to the industry, arguing that successful exploration produces a productive asset and therefore, like other expenditures of a capital nature, attributable exploration expenditures should be depreciated over the economic life of resulting mineral deposits.

Participants argued against this view on a number of grounds. First, CRA (sub. 73, p.52) likened exploration expenditures to research and development (R&D) expenses: "As the life-blood of the industry it is akin to R&D, although it is even more important to the mining industry than R&D is to most other activities." The Commission accepts this analogy. Thus, the 150 per cent tax deduction (and other R&D assistance schemes) currently available to non-mining activities discriminates against mining, although the decision to reduce the R&D deduction to 100 per cent of eligible expenditure from 1 January 1991 would remove most of this bias.
Second, it was argued that exploration expenditure is of a revenue nature for specialised exploration companies who derive income from selling exploration leases. For these companies, exploration is an operating expense incurred in earning assessable income - income from the transfer of mining rights (and not a stream of mineral revenue from a capital asset).

Third, in practice no assistance may be derived in many cases. To utilise the deductibility provision a company must either earn assessable income in the period the expenditure was incurred (or in the future), or use the `group' loss transfer provisions. In many cases assessable income will not eventuate because the exploration proves unsuccessful and many exploration companies are not part of a group (as defined in the legislation).

Finally, AMIC (sub. 29, pp.84-5) commented:

The immediate deductibility of exploration and prospecting expenditure is an attempt to correct the non-neutral implications of corporate income tax on the expected rate of return to exploration compared to other activities. Successful exploration expenditure results in a productive asset. Unsuccessful exploration does not. The low success rate of exploration means that only a small part of exploration expenditure would be deductible in the absence of 122J. This would result in a reduction in the post-tax expected rate of return on exploration compared to the post tax return on a less risky investment with a similar pre-tax expected return.

However, this is an argument for permitting unsuccessful exploration expenditure to be deductible (in some way) for calculating assessable income, rather than determining whether such expenditure should be amortised or made fully deductible.

In the Commission's view, although immediate deductibility of exploration expenditures may involve an element of assistance, this `concession' is the least distorting tax treatment in terms of the efficient allocation of resources in the economy.

Of perhaps more concern to the mining industry is that section 122J is restrictive in its application. For example, AMIC (sub. 29, p.85) considered that the requirement that eligible expenditure be undertaken on a mining tenement:

... does not recognise the nature of modern exploration techniques and, as such, potentially excludes a considerable amount of exploration expenditure. Preliminary exploration over broad areas is an essential prerequisite to exploration on specific mining tenements. This regional exploration, involving the use of sophisticated technology, is an increasing trend in the industry and reduces the uncertainties associated with traditional on-site exploration methods.
The definition of exploration expenditure is also fundamental to calculating the mineral rent attributable to a deposit in the context of certain royalty schemes (see Section 14 of Volume 3). Restricting deductible exploration expenditure to that incurred ‘on tenement’ fails to recognise the total investment directed at establishing a viable mining operation. On the other hand, allowing attributable ‘off tenement’ expenditure to be deductible will increase the degree of discretion in the tax system (because of problems which may arise - such as how much head office, laboratory and ‘desktop’ expenditures are properly attributable to the discovery of a particular mineral deposit).

In deciding where to draw the boundary the guiding principle should be whether the expenditure contributes to earning assessable income. The intent of all private exploration activity is to contribute to a viable mining operation. It appears inconsistent that exploration expenditure can be deducted against income from other sources or transferred within a group - while off-tenement exploration expenditure which arguably contributes just as much to establishment of a viable operation is not deductible. (It is also worth noting that the parallel provision for petroleum - section 122AH - does not restrict eligible exploration expenditure deductions to ‘on tenement’ outlays.)

<table>
<thead>
<tr>
<th>The Commission recommends that the definition of eligible exploration expenditure in section 122J of the Income Tax Assessment Act 1936 be broadened beyond the existing ‘on tenement’ definition to include all properly attributable exploration expenditure, including modern approaches such as remote sensing and ‘desktop’ research.</th>
</tr>
</thead>
</table>

The term feasibility study in the context of mining and minerals processing activities can refer to a wide range of activities - from outlays involved in ‘proving up’ ore before commercial mining begins (eg assaying, pilot ore-crushing plants) to expenditures which are clearly unrelated to the exploration phase of mining and minerals processing (eg surveys of necessary mine infrastructure, feasibility studies of processing activities). The latter types of expenditure should be treated like other outlays of a capital nature, that is, depreciated over the economic life of the resulting project.

<table>
<thead>
<tr>
<th>The Commission recommends that expenditures on feasibility studies which can be regarded as essentially exploration-related also be deductible under section 122J of the Income Tax Assessment Act 1936.</th>
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A further concern expressed by a number of participants about the tax treatment of exploration expenditures concern the treatment of ‘farmouts’ by the Australian Taxation Office.

A farmout involves the assignment of an interest in an exploration right to another party which in return agrees to undertake a specific exploration program. Although no money usually changes hands, a farmout agreement constitutes a disposal of property so that the issue of the transaction being liable for Capital Gains Tax (CGT) is raised. The Commission agrees that, in principle, a farmout should be liable for CGT - but notes that the valuation problems raised by such transactions may be quite serious.
4 MINE APPROVAL

Notwithstanding that the size and nature of some mining proposals may necessitate careful scrutiny (and sometimes outright rejection), procedures for determining whether to permit mining projects to go ahead are ill-defined, cumbersome and time-consuming. Moreover, existing mechanisms for resolving land-use conflicts - particularly 'development versus conservation' debates - fail to allow rational assessments to be made which could ensure that the community receives the maximum benefit from Australia's natural resources. This chapter examines these problems and canvasses possible solutions.

If exploration yields an economic deposit the next step is to attempt to gain approval for mining.

Should the right to explore automatically confer the right to mine? If not, what general principles should apply when deciding whether to permit mining? How can such principles be applied in specific situations, for example where environmental concerns loom large or where the rights of private landholders may be infringed? Are existing processes for determining the right to mine effective and how could they be improved? How useful are environmental impact statements? Where mining may conflict with other uses of land (eg for conservation), what changes to existing procedures would improve decision-making? Should more uranium mines be allowed in Australia? It is the purpose of this chapter to examine these issues.

4.1 Should the right to explore imply the right to mine?

This question was seen by the industry as central to the further development of the mining and minerals processing industries. Two aspects can be identified:

- whether a company or individual, having been granted the right to explore, should have first option on the right to mine any resulting economic discovery; and

- whether society should always permit mining to go ahead if exploration reveals an economic deposit.

The Commission's view on the first of these aspects has been discussed in some detail in the previous chapter. Essentially, the Commission agrees with the proposition that the holder of the right to explore should have first option on the right to mine, rather than having this right given to someone else. Indeed, the Commission has proposed establishment of long-tenure mineral rights which include the right to mine (subject to pre-announced conditions).

This chapter focuses on the second aspect of the question.

Some mining companies argued that if permission to explore does not automatically allow them to mine in the event that a viable mineral deposit is discovered, there is a disincentive to explore in the first place. For example, Stockdale Prospecting Ltd stated (Stockdale, sub. 43, p.2) that:
While in most states there is not a legal nexus entitling a successful explorer to convert his exploration title to a mining lease there is a well-recognised expectation that this is the rule, based on the concept that the explorer, having taken the high risk, is entitled to the reward of his endeavours.

North Broken Hill Peko Ltd (sub. 33, p.5) submitted that:

The right to mine a prospect identified through successful exploration ought to follow automatically to the discoverer. At present it usually does, but there is no guarantee that it will. The lack of such a guarantee is also inhibiting Australia's success. There are admitted problems with a blanket guarantee, but at least the guarantee ought to be made applicable unless defined, identified criteria are not met. This can be done, it should be done. There are too many examples of successful exploration leading to a deadlock, including a loss for the foreseeable future of the exploration investment, for reasons which were not apparent when exploration commenced.

On the other hand, conservationists fear (particularly in respect of areas they value) that once permission is given for exploration, it will be inevitable that mining will go ahead if something is found, since commercial pressures and the prospect of state coffers swelling with royalty payments will be too hard to resist.

The view put by Alcoa of Australia (Alcoa, sub. 16, p.3) was that:

The industry recognises that the identification of a mineral resource does not confer an automatic right to proceed with the development of a mine. All projects which have the potential to cause significant environmental impact should be subject to an appropriate level of environmental assessment. Projects in environmentally sensitive areas will generally be subject to stringent conditions of environmental approval, or may not be approved at all. This is recognised and accepted by the industry.

This view correctly recognises that the mining industry cannot have it both ways. If exploration is seen as an information-gathering process to enable rational decisions to be made on land use, then clearly there is the possibility that mining may not be permitted. To argue that mining should always follow exploration is to ignore potential alternative land uses. Society cannot guarantee that mining will be allowed to proceed in all cases just because private interests anticipate that it will be profitable to undertake such an activity. If mining companies find it unacceptable to separate the exploration and extraction stages of mining and therefore decide not to undertake the first if there is any possibility that the second will be placed in jeopardy, that must be their commercial decision. Conversely, it is equally invalid to argue that exploration should be banned because extraction may not be allowed - such as in national parks.
While explorers should not be given an absolute right to mine, there should be a substantial degree of certainty as to the processes which will be followed and how decisions on whether to permit mining will be made should exploration yield an economic deposit.

This would fulfil the need, already recognised by the Commonwealth Government in its discussion paper on ecologically sustainable development (Commonwealth of Australia 1990, p.16), "that there is a case for greater degree of certainty in relation to access to resources than has been provided to date."

4.2 In deciding whether or not to permit mining, what general principles should apply?

Given that the right to mine should not automatically follow from successful exploration, what principles should apply in making such decisions?

Like any rational decision, the basic requirement is for the relevant costs and benefits of the alternatives to be systematically weighed. It should be borne in mind, however, that ascertaining benefits and costs itself involves costs (eg having to undertake cost-benefit analyses of various options).

The main benefits from permitting mining are the additions to national wealth generated from exploiting mineral deposits. The main costs include the opportunity costs of any activities forgone because of mining (eg agriculture on the same land) as well as any other costs (eg environmental damage) which may be imposed on other landowners or the community at large.

Assessment of these costs and benefits will vary according to the time frame under consideration. What should be aimed for is the best use of the land to be made over the long term. This implies that we should not ignore long-term effects for short-term gain (eg long-term effects on the environment). However, we also need to recognise that a particular land use (such as mining) might be a temporary one and that restoration/rehabilitation subsequent to mining operations may open up other possibilities (see Chapter 6). For example, while mining may be incompatible with conservation or recreation in the short term due to disturbance to the land and creation of unsightly features, this may not be so in the longer term once restoration/rehabilitation programs are complete. In this regard, the Queensland Chamber of Mines noted (sub. 74, p.16) that:

In advocating a policy of multiple land use it must be stressed that potentially competing land uses need not be simultaneous but could be sequential. For example, conservation could lead to mining which in turn could lead back to conservation or recreation. Similarly, mining should occur before housing or other surface development is permitted.

Assessment of costs and benefits will also vary according to the nature of the land in question. For example, where mining is being considered on Aboriginal land, any adverse impact on local communities' way of life is an important cost to consider. Similarly, mining on rural land should only be permitted if the benefits outweigh the costs of forgone agricultural production. The value to society of land of particular environmental value (eg national parks) needs to be considered when mining is contemplated in such areas. In each of the above cases, any indirect costs or benefits external to the land itself also need to be taken into account. These might include environmental impacts on the wider community - such as waste disposal and pollution associated with the processing of minerals.
The appropriate mechanism for converting the right to explore into the right to mine will also vary depending on the circumstances of each particular case. Where land has little alternative use, approval procedures should be relatively straightforward - principally focussing on ensuring that any costs associated with potential environmental problems are adequately taken into account. As discussed further below, where relevant costs and benefits can be reflected in (market) transactions based on clearly defined and enforced property rights, market-based mechanisms may be sufficient to ensure that mining will only take place when it is in the community's interests for such developments to proceed.

Of immediate interest here is how the above principles can be applied to situations where environmental considerations loom large in the decision whether or not to permit mining. Situations where other concerns - such as those of private landholders - are addressed later.

4.3 How successful are existing mechanisms for taking environmental considerations into account?

In recent years 'development versus conservation' debates have tended to escalate. Mining has often been at the centre of these debates. To some extent, this reflects the fact that it is no coincidence that the very land which is rich in natural features is often prospective for minerals.

Often the debate has been cast in terms of whether exploration and mining should 'dominate' conservation or vice-versa. What should be the 'dominant land use'? Traditionally, it might be argued that mining has been seen as the dominant use. Many arguments by the mining industry implicitly assume that mining is (or should be) the preferred use. Consider, for example, the following comment by Stockdale (sub. 43, p.6):

... where a government is in a position to decide or influence a decision it should establish a framework aiming for the outcome giving the highest economic return to the public at large (defined in a broad sense). This was, in effect, the position under most States' Mining Acts as they took precedence over other legislation.

The presumption that mining should take precedence over other land uses is often based on the notion that "the location of mineral deposits has been fixed by geological events of the past" (South Australian Chamber of Mines and Energy, sub. 132, p.7). However, as noted by the Nature Conservation Society of South Australia (sub. 30, p.1), "the argument that mining has to occur where minerals are found applies equally to conservation areas".
On the other hand, a number of submissions from conservation groups echoed the view of the Total Environment Centre (sub. 10, p.2) that "... the environmental effects of minerals exploitation should be the first priority criterion to determine the overall benefit of proposed projects to society".

Mining interests claim that the pendulum has now swung too far the other way, and that conservation or preservation have now become dominant uses.

The fact that divergent views are held by different groups in society does not in itself represent a problem in terms of ensuring that natural resources (including land) are allocated to their most valuable use. The problem arises only when mechanisms for resolving conflicts result in 'one-sided' decisions which focus exclusively or predominantly on only one side of the equation, that is, take only environmental or only developmental concerns into account, with little real attempt to integrate the two to come to a balanced decision. In the words of Association of Mining and Exploration Companies (AMEC, sub. 15, p.16):

... the present system has failed to produce a reasonable method of dispute resolution, free of the manipulation which is always inherent in a process where elected Governments are directly involved in each case decision.

The Coronation Hill experience (see Section 21 of Volume 3 and also Volume 4, 'Coronation Hill and the Kakadu Conservation Zone') was cited by many participants as an example of the failure of existing decision-making processes to resolve conservation-development conflicts. In light of its experiences, the Coronation Hill Joint Venture (sub. 27, p.1) declared that:

There is increasing lack of confidence in governments making balanced and rational decisions based on the facts of the situation as opposed to them adopting politically expedient solutions. The Coronation Hill Project typifies these problems. Over six years have elapsed since gold and platinum group metals were first located at Coronation Hill. Since that time many unnecessary obstacles have arisen which have significantly delayed the possible development of the mine.

Although the rights or wrongs of mining at Coronation Hill has been the subject of bitter public debate, there can be little doubt that the processes for handling the issue were highly unsatisfactory. Coronation Hill is not an isolated example of such problems. Rather, it is an example of a general failure of existing institutional arrangements to deal adequately with these land-use conflicts. The Commission received evidence of many similar experiences (see Volume 4, 'State government regulation: a case of too much red tape and costly delays').

The Coronation Hill/Kakadu Conservation Zone experience graphically illustrates the need to devise better systems for making land-use decisions. Current approaches are creating great uncertainty and cost for all those with a stake in the outcome.

Lack of rational and transparent decision-making processes appears to have carried over to other areas of government decisions on land use affecting the mining industry. For example, a common complaint was that national parks have been declared without proper assessment of their mineral
potential (or even their nature value). Similarly, it was claimed by many participants in this inquiry that the way in which National Estate listings operate in practice effectively result in land-use decisions being made without any reference at all to the values of alternative uses - and without compensation paid to those suffering loss as a result of these decisions. Similar claims were made in respect of World Heritage listings.

A further problem arises from existing divisions of powers between State and Commonwealth governments. Decisions on public land uses are made (or can be influenced) by all levels of government (Attachment 7A of Volume 3 outlines the legal framework within which environmental regulation in Australia is applied). While the States and Territories have primary responsibility for public land-use decisions, the Commonwealth has a number of powers under the Australian constitution which enables it to exert influence, and in some cases override, land-use decisions made by the States/Territories. Relevant legislation which can be (and has been) used to this effect includes the Commonwealth National Parks and Wildlife Conservation Act 1975 (see Attachment 6A of Volume 3), the Australian Heritage Commission Act 1975 (see Attachment 6B of Volume 3), the World Heritage Properties Conservation Act 1983 (see Attachment 6C of Volume 3), and the Environment Protection (Impact of Assessment) Act 1974 (see Section 9 of Volume 3). Another mechanism the Commonwealth Government can use to stop a development it thinks should not proceed is to make it clear that export permits will not be issued. (This mechanism was used to block sandmining on Fraser Island.)

The Queensland Government stated that (sub. 55, p.27):

In the past there has been a degree of Commonwealth/State tension on environmental management matters based on a perception of Commonwealth interference in areas of State Government responsibility. The present Queensland Government favours a co-operative solution to any State/Commonwealth conflicts over resource development and environmental protection. State/Commonwealth arrangements need to recognise the States have substantial policy and administrative responsibilities in these areas and have a strong capacity to manage environmental performance and to make land-use decisions.

The Department of Arts, Sport, the Environment, Tourism and Territories (DASETT, sub. 65, p.5) considered that:

... [our] federal system of government provides an impediment to the efficient use of natural resources. The responsibility for land and resource use lies with the individual State governments and the Commonwealth has limited powers, predominantly sourced through international treaties and obligations, and its monetary powers.
Existing institutional arrangements for resolving conflicts between miners and those advocating use of land for other public purposes (eg for conservation) have proved inadequate. A basic problem is that present processes for resolving conflicts do not allow sufficiently for an objective balancing of costs and benefits of conservation/development. This can mean that both conservationists and developers are able to achieve land-use decisions favourable to them, without having to bear all relevant costs. Another problem is lack of certainty as to what processes will be followed in coming to such decisions.

Some conservationists argue that valuing the environment is enormously dangerous and economically stupid and ethically wrong since it is impossible to put a monetary value on the environment. Certainly, valuing services provided by the environment can be extremely difficult (see Attachment 7A of Volume 3 for a discussion of some of the methods available to value the environmental implications of development and some of the problems associated with such methodologies). As challenging as it may be, however, the fact is that society establishes such values (often implicitly) all the time. The real difficulty is how to make the valuation mechanisms used to compare alternative land uses explicit rather than implicit. There are signs that the need to make explicit comparisons of all potential land uses is becoming increasingly recognised. For example, the Australian Conservation Foundation said (ACF, sub. 68, p.16) that:

In economic terms the debate should be about the net present values generated by alternative uses. All land-use alternatives have an environmental dimension irrespective of their location on the continuum between National Parks and cities.

It also considered that:

We believe that for many projects, in particular for those planned in areas of conserved biological heritage, there are grounds for a plausible economic argument favouring conservation. (This is separate from the normal value-driven preservation arguments.)

The above quotes indicate a growing recognition of the need to integrate environmental and development considerations in a consistent decision-making framework. These ideas have evolved into concepts such as ‘sustainable development’ and ‘multiple (or sequential) land use’. These terms are often loosely invoked to describe the need to strike an appropriate balance between conservation and development. (An examination of the meaning and implications of ‘sustainable development’ as it affects mining and minerals processing can be found in Section 8 of Volume 3.)

In the Commission's view, government-imposed mechanisms for resolving land-use conflicts should:

• allow for all relevant costs and benefits to be first determined, then weighed;
• promote certainty through well-defined rules and decision-making processes;
• assess costs and benefits in a way open to scrutiny by those affected by decisions (transparency).
In broad terms, such mechanisms can be classified into those which rely on market-based incentives, and those which entail a significant government role in decision-making (see Section 4.5).

4.4 What have governments done?

Commonwealth initiatives

In 1983, the Commonwealth Government, in consultation with a range of interested parties, developed a National Conservation Strategy for Australia (NCSA). The broad principles translated into the following guidelines for day-to-day decision making:

• there should be an integrated approach which takes conservation (including all environmental and ecological considerations) and development aspects into account at an early stage;

• resource-use decisions should seek to optimise the net benefits to the community from the nation's resources, having regard to efficiency of resource use, environmental considerations and an equitable distribution of the return on resources; and

• Commonwealth decisions, policies and management regimes may provide for additional uses that are compatible with the primary purpose values of the area, recognising that in some cases both conservation and development interests can be accommodated concurrently or sequentially, and in other cases, choices must be made between alternative uses or combination of uses.

While many participants in this inquiry lauded the general sentiments expressed in the NCSA there was a feeling that its principles had not been put into practice. The Queensland Chamber of Mines, for example, contended (sub. 74, p.36) that:

The experience since the announcement of those principles has been that the Federal Government has moved in completely the opposite direction.

There is now a need for these principles to be put into place by State and Federal Governments so that we are in accord with the principles of the National Conservation Strategy of Australia and the Brundtland Commission recommendations in Our Common Future.

Simply put, the Chamber believes there must be a structure in place which allows the competing arguments for land uses to be assessed objectively, with expert advice and information available and with no regard to the ability of any one group to whip up emotional and politically based campaigns which will distort the issue.

Resource Assessment Commission

In 1988, the Commonwealth Government announced the formation of the Resource Assessment Commission (RAC). The RAC is to investigate and report to the Prime Minister on the environmental, economic, financial, cultural and social implications of major resource-use proposals and provide the Government with informed advice about the options available in relation
to those resources and their future utilisation. In developing its functions the RAC is to examine
major resource-use conflicts through a public inquiry process designed to reduce the level of
confrontation which has frequently surrounded the consideration of conservation and development
issues. One of the RAC inquiries is into options (including mining) for the future use of the
(Kakadu) Conservation Zone in the Northern Territory. In addition to providing a new mechanism
for addressing specific resource-use problems, the RAC intends, over the longer term, to "develop
general principles and methodologies for the evaluation and resolution of conflicts between
competing resource-use proposals" (RAC 1989).

Whilst many participants generally supported establishment of the RAC, this support was often
qualified (see Section 6 of Volume 3).

Other initiatives

The Commonwealth Government has established nine sectoral working groups (with broadly based
representation under independent chairpersons) to examine the issue of ecologically sustainable
development and its application to various sectors of the Australian economy, including mining. A
Commonwealth discussion paper was released in June 1990 which, together with ensuing
submissions, formed the frame of reference for individual working groups (involving industry,
union and conservation groups) to formulate ecologically sustainable development strategies for
each main industry sector which use or have a significant impact on natural resources. The
working groups will report to the Commonwealth Government later in 1991. The Department of
the Treasury has also released a related paper outlining principles and policy options for economic
and regulatory measures bearing on the environment.

The Commonwealth has also taken steps to improve informational databases on environmental
resources, in co-operation with the States. In 1988, it established the National Resource
Information Centre, while in 1989 it announced that it would fund an Environmental Resources
Information Network to "draw together, upgrade and supplement information on the distribution of
endangered species, vegetation types and heritage sites" (Prime Minister of Australia 1989).

State/Territory initiatives

The Tasmanian Chamber of Mines (sub. 81, Appendix 1, pp.64-5) considered that Victoria was
possibly the most advanced State in terms of integrated land-use planning, having established a
representative Land Conservation Council under the Land Conservation Act 1970. The Tasmanian
Chamber of Mines also noted that a more informal mechanism operated in NSW via the Premier's
Round Table, involving the Ministers responsible for the Departments of Minerals and Energy, the
Environment, Planning and Natural Resources, and representatives of the NSW Land Conservation
Council and the ACF. A similar arrangement is apparently being established in Western Australia.

The Queensland Chamber of Mines (sub. 74, pp.30-1) considered it essential that State
governments put in place some policy framework whereby Cabinets can consider the interests of
both conservation and development, stating that "Queensland, in keeping with almost every other
State Government, has no policy or framework to handle the looming conflicts of the 1990s". The
The NSW Government indicated (sub. 52, p.38) that "... government authorities are examining multiple land-use concepts including the suitability of land for different uses and the capability of different land types to accommodate changes in land use". It noted that the Department of Minerals and Energy is currently assembling information on the amount of land available for exploration and on [estimates of] monetary value of mineral potential - to be used as inputs into `land capability' or `land suitability' analyses as a basis for more informed land-use decisions.

In Tasmania, the Legislative Council set up a Select Committee in October 1989 to inquire into the general question of public land use. This Committee found that "there is broad community dissatisfaction with the ad hoc and adversarial nature of historical attempts to resolve major land use decisions", and recommended establishment of an independent Tasmanian Public Land Allocation Authority to manage and facilitate land-use decision-making processes within the State.

In Western Australia, most public land is vested in constituent bodies of the Department of Conservation and Land Management. Proposals to change land use/tenure are controlled by the Conservation and Land Management Act 1984 and involve public notification and wide circulation of a comprehensive proposal report, public participation, and full Parliamentary debate and approval of the Minister's recommendation.

The NT Government (sub. 136) stated that it was in the process of developing a Conservation Strategy for the Territory to provide mechanisms for improved community participation in environmental planning and resource development issues, more flexible and responsive processes within government and industry to encourage integration of conservation and development, and an improved basis for policy and legislative review processes - so as to improve the capacity to manage sustainable development. It also noted that it has already initiated processes within government to improve decision-making including: the development of a comprehensive Geographic Information System for the assessment and evaluation of ecological and environmental data to interact with other resource management databases within government; development of more integrated resource utilisation, planning and monitoring networks within government (eg arrangements between the Conservation Commission and the Department of Mines and Energy with respect to mineral exploration and development procedures including agreements for exploration and mining on Territory Parks and Reserves); and the commencement of reviews of the Planning Act and the drafting of new Heritage legislation - both aimed at integrating conservation and development planning.
4.5 What more could be done?

Existing arrangements for resolving land-use conflicts between mining and public land uses - such as conservation and preservation - have imposed considerable costs on the Australian community. Whilst governments have supported concepts such as sustainable development and multiple land use, much remains to be done in translating these into practical policies.

The policy options available range from those that rely heavily on market mechanisms to those that involve a central role for government.

There are cogent reasons for placing greater reliance on market-based mechanisms

One approach to resolving public land-use conflicts is to rely as much as possible on market forces to ensure that land is devoted to its most valuable use. The crucial advantage of a market approach based on private property rights to land is that it would help to ensure that individuals take into account the costs they impose on others by their actions, rather than relying on political lobbying to influence land-use decisions. A market-based approach relies on the existence (or creation) of well-defined property rights to enable owners of assets to charge for their use (or to sell them outright to someone who values them more). Private ownership provides strong incentives to manage resources to maximise their value (see Attachment 2A of Volume 3). For example, an indication of the value that conservationists place on Kakadu would be provided if they were in fact private owners of the land and were faced with a proposal to mine Coronation Hill (which involved some monetary gain and/or sharing in profits from the operation). The same is true of Aborigines with a stake in what happens to Coronation Hill. Such a `market' experiment may in fact be the true of who places most value on the area. Of course, transferring areas of high conservation value (such as national parks) at no cost to an appropriate conservation group would raise equity questions analogous to freely transferring mineral rights to surface owners.

Another market-based approach would involve the auctioning of (long-term) mineral rights, with bidding being open to those who wish to preserve the land for purposes other than exploration or mining. Provided no conditions were placed on the rights allocated (eg stipulations that a certain amount of exploration or mining activity must be carried out), the winning bidder could simply choose not to exercise the right to exploit any mineral resources on the lease. Of course, to make the auction `fair', if mineral rights were auctioned subject to pre-announced royalty arrangements the successful bid would have to be allowed to be offset against possible future royalty payments should the auction be won by a prospective explorer/miner (or be subsequently transferred to a company who intends to mine).

Such market solutions are more likely to succeed when it is possible to exclude people and charge them for access to the resource (see Attachment 2A). In cases where a particular land use (eg preservation) provides benefits not easily captured through market transactions, market solutions may result in insufficient resources being devoted to that land use. As noted by Australian Bureau of Agricultural and Resource Economics (1989):

In principle, it may not be difficult to establish a property right to an area of land but the allocation of that right through, for example, an auctioning process would require a bid from all parties who value the resource - that is, from both the beneficiaries of minerals and forest products and from the beneficiaries of conservation.
There are private organisations such as the Australian Conservation Foundation which could be seen as representing the views of those in society who value conservation. However, it is doubtful as to whether the social preferences and values regarding conservation will always be adequately represented in any actual auction. This arises principally because the benefit received from conservation is frequently ‘non-rival' and ‘non-exclusive'.

While it is probably true that the full value to society of conservation may not be represented in an auction, the same may be true for other land uses. For example, miners may not be able to capture the full value of an investment in an exploration or mining right - as when exploration reveals information on the prospectivity of areas external to the lease.

It may also be the case that much more of the conservation value of land can be captured through market transactions than is commonly supposed. In some cases it would appear that creation of markets to resolve land-use conflicts is hindered by government restrictions on property rights or pricing, rather than any inherent difficulty in defining and enforcing property rights. For example, failure to charge visitors to national parks the full costs of providing park services results in an undervaluation (and overuse) of land set aside for this purpose. In this context, the ACF (sub. 68, p.22) contended:

In economic terms the conservation movement would like to see a level playing field established such that economic services provided by the environment (including National Parks) are valued at their market price rather than arbitrarily sold at, what appears to be, a beneath market price to boost the production of some other alternative product.

The ACF went on to observe (sub. 68, p.18):

... the market for conserved biological heritage ... is to Australia what the great museums and galleries are to Europe. That is, they are internationally traded commodities that no nation would consider selling, despite being virtually priceless. Our unique natural heritage should be seen in the same light. Visitors will pay to visit this heritage.

Market-based approaches may not only involve buying/selling land and/or mineral rights in the first place, but may involve ex post charges for the use of assets associated with utilisation of land for a particular purpose (or purposes). If a potential miner is faced with the full costs to society of mining in a particular area, mining will only proceed if it represents the most valuable use to society as a whole of the particular piece of land, rather than just the most valuable use to the miner. Making miners fully liable for environmental damages (eg via the posting of rehabilitation and/or performance bonds, through imposing effluent charges etc) is another way of bringing attributable costs to bear through the application of economic incentives. Knowing that a mining operation will be required to bear attributable costs associated with maintaining an acceptable environment once extraction commences (or is completed) - would affect ex ante decisions on land use (see Chapter 6).
Further consideration and discussion of these and other market-based approaches to resolving resource allocation (including land-use) problems can be found in Section 7 of Volume 3. The Commission accepts, however, that such mechanisms may not provide a universal solution to all land-use conflicts, but advocates reliance on market-based mechanisms to the maximum feasible extent.

There is considerable scope for increased use of market-based mechanisms for resolving many resource-use conflicts (which can obviate the need to invoke what usually turn out to be expensive public decision-making processes - particularly in contentious cases). However, in some cases market solutions may not prove feasible (eg because of the nature of conservation goods - where it may be impossible to exclude or charge consumers of these services).

**Government approval processes should be streamlined and made more certain**

Where market approaches are not considered feasible, there may be a need for government intervention in land-use decisions. Such intervention should aim at rational, informed decisions made under transparent processes which are open to public scrutiny. This is not to say that a full-scale RAC inquiry or a cost-benefit analysis should be done on every land-use issue on which governments must pronounce. Depending on the nature and significance of the proposal, this might vary from formal cost-benefit analysis to the integration of environmental and economic considerations into legislation and into day-to-day decision-making processes. In this regard the Normandy Poseidon Group argued (sub. 11, p.11) that:

Most applications for mining developments should be dealt with by the normal process of Environmental Impact Statements, public hearings, statutory reviews and eventual decisions by the appropriate authority. Serious conflicts over potential developments may be best resolved by reference to the Resource Assessment Commission.

The cumbersome processes required to obtain government approval for mine developments were seen as one of the major impediments to the efficient development of natural resource-based industries in this country. For example, the NSW Coal Association submitted (sub. 45, p.10) that the dual approval systems in NSW:

... frequently overlap or duplicate one another, causing delays in the determination of mining applications and placing an unnecessary workload on both developers and government authorities ... Export markets are noted for their volatility and opportunities to capture market opportunities often arise suddenly and must be captured rapidly in the face of intense international competition. The extended time involved in the approval procedure can thus prevent developers in NSW from capturing these opportunities, causing the State to lose out to competitors in other States or overseas.
In some instances developers are unable to ascertain from authorities exactly what processes will be required in order to gain approval, how long it will take, or what factors may cause progress to be obstructed or delayed at any time during an expensive development sequence. Costs to the mining industry (and the economy generally) take the form of delaying returns on exploration expenditures and from keeping capital idle, as well as excessive expenditures necessary to comply with duplicative and highly detailed application requirements. Box 4.1 illustrates one example of the problems encountered. Many more examples of inefficient and drawn out approval processes - and the costs they entail - are documented in Volume 4, 'State government regulation: a case of too much red tape and costly delays'.

**Box 4.1 Western Mining Corporation's Bendigo project**

The Bendigo exploration licence was granted in May 1978. However, the start of work was delayed because drilling was a prohibited activity in Bendigo until September 1980 and in Eaglehawk until December 1981. WMC decided in September 1985 to begin underground evaluation. At that stage all Councils and Government bodies expressed the belief that a February 1986 start up was possible. The last approval was obtained in August 1986. In September 1986 WMC decided to expand underground evaluation to at least two other sites. At this time the Fortuna Group lodged objections with the Warden's Court. Given the large capital investment required, WMC did not proceed until the matters were dismissed by the Warden in April 1987 and the Minister issued an Intention to Grant in May 1987. Between the formal commencement of work on the Environment Effects Statement in June 1987 and the first available construction time after final approvals were received, eighteen months had been lost due to approval delays. Evaporation pond construction for further dewatering operations has been delayed to October 1989, also due to delayed planning decisions.

Thus the current situation with the project is that:

- it has been in progress for ten years;
- over 40 planning permits have had to be negotiated;
- several public exhibition periods and public hearings have occurred;
- over $20 million had been expended;
- no commercial production of income had been achieved.

*Source: Victorian Chamber of Mines Inc. (sub. 21, exhibit 11, item 2)*

The interaction between mining and other relevant State/Territory (and even Commonwealth) legislation (eg environmental and planning laws) is characterised by duplication and lack of co-ordination. This results in inefficient and drawn-out approval procedures which impose substantial costs, delays, and uncertainty which can jeopardise the viability of mining/mineral processing projects.

As these impediments also potentially impose substantial costs on the community as a whole, it is important that mechanisms which streamline the approval process, whilst adequately addressing other concerns (eg the potential to cause environmental effects) should be established.
The Commission recommends that approval processes be streamlined by having one government agency responsible and accountable for processing a mining application within set time limits.

The Commission recommends that State/Territory governments critically review the range of regulations with which mining developments must comply, and remove those which are no longer necessary or duplicate others.

Current mining legislation in Australia generally reserves to the relevant Minister a discretion to grant or refuse a mining lease to the holder of an exploration licence who has been successful in exploration or to the holder of a retention title.

If powers of discretion over the granting of mining applications are retained, the grounds on which refusals can be made should be prescribed in legislation and written advice stating reasons for a rejection should be required.

How effective are Environmental Impact Analyses?

In recent years environmental impact analysis has evolved as a means of taking into account the likely environmental implications of proposed developments. A requirement to prepare an Environmental Impact Statement (EIS) is now often an integral part of the approval process faced by potential miners.

Responsibility for the preparation of an EIS, including the research component, rests with the proponent of a project. Proponents may prepare the statement themselves, but usually hire a consultant to prepare it for them. This raises questions regarding the objectivity of the EIS process. The Total Environment Centre (sub. 10, p.2) claimed that environmental studies for mining proposals are often ad hoc and prepared by consultants captured by their client's expectations. Quoting a retiring director of the NSW Department of Environment and Planning, they suggested:

... the system of assessing the environmental impact of major projects was fast approaching a crisis of credibility ... the system is being abused. The documents used to justify projects (environmental impact statements) were often inadequate, failed to address relevant issues, were misleading and issued contradictory and biased information. They were often lacking in substance, or contained superficial analysis ... they also failed to adequately justify proposals ... and sometimes they were not done at all.

On the other hand, the NSW Chamber of Mines, Metals and Extractive Industries (sub. 37, p.7) argued that:

The current [NSW] system of public participation is far too loaded in favour of the end of the process - an attitude of 'wait and see/I can always object' has developed due to the structure of the legislative and administrative process ... Many cases involve an enormous amount of resources and time and those representing the public interest are often pressure groups opposed to development in general rather than a particular development. ... The system designed to protect the public is now abused.
Some companies complained that they have undertaken a comprehensive EIS in line with legislative requirements, but that such studies have then not been accepted (or they have then been asked to undertake further examinations). A prime example of this is the case of Coronation Hill (see Section 21 of Volume 3).

Environmental impact analysis as currently undertaken in Australia has many problems. Questions have been raised about the scope, content and scientific integrity of many EISs prepared in support of mining and mineral processing (and other development) projects, as well as whether a project-by-project approach is desirable. Concerns have also been expressed about limited opportunities for public participation in the process, and the potential for the whole process to become hostage to political expediency.

In the Commission's view, environmental impact assessment as currently undertaken in Australia has numerous deficiencies.

**What improvements could be made?**

The Commission is far from convinced that undertaking environmental impact analyses of proposed mining development projects is preferable to enlisting other mechanisms (e.g. market-based ones such as pollution taxes or forfeiture of performance bonds) which may be able to achieve desired environmental outcomes at less cost.

Where it is decided that going down the environmental impact analysis/statement route is appropriate, one possible approach would be to confine environmental impact assessments/statements to being (as the name implies) primarily scientific studies which address:

- the likely environmental consequences of a proposed project (or series of projects where this is an issue), including what measures could possibly be taken to lessen or minimise the likelihood of environmental damage; and

- what measures the proponent actually proposes to take to limit possible adverse environmental consequences.
If the administering authority considered a particular proposal (or series of proposals) to be particularly sensitive in terms of potential environmental consequences, a body with appropriate scientific expertise (such as the Commonwealth Scientific and Industrial Research Organisation) could:

- discuss possible environmental consequences of the proposal(s) with the proponent, and therefore what the environmental impact analysis should desirably address (and possibly the most appropriate way to address various environmental concerns): and

- provide its advice in writing both to the proponent and to the Department of Arts, Sport, the Environment, Tourism and Territories (or its equivalent State/Territory body).

The proponent would be under no obligation to follow the scientific advice offered, but would know that the administering body would almost certainly seek the views of the scientific body on the proponent's EIS, before providing its own advice to government on the adequacy of both the EIS and the steps proposed by the proponent to limit adverse environmental impacts. Since involving independent scientific experts would involve extra delays, the Commission wishes to emphasise that such a course of action should only be pursued in exceptional circumstances.

In most cases government should be able to make a decision on the acceptability of a project on the basis of the proponent's environmental impact statement, with strict limits on how much time can be allowed to elapse before a decision is taken.

In cases where there are other (and demonstrably incompatible) claims on the land (e.g. involving some exclusive public use of it), such studies could then inform a wider consideration (undertaken by an independent agency) of the likely economic costs and benefits of alternative courses of action. Such an approach appears to have been endorsed by the ACF (sub. 68, p.15) which proposed that:

Where a project goes ahead the opposing choices should be made publicly available. The net benefits in export earnings will need to be contrasted against the environmental damage that is done in the process and the future economic cost of rehabilitation and clean-up. Such detail could be included in a wider-ranging and revamped Environmental Impact Statement process that needs to be a comprehensive cost-benefit analysis similar to the approach that is adopted by the Resource Assessment Commission. The process would also require public consultation with the community and include assessment of non-economic values. The present process is widely regarded as poor and needs improvement.

However, if cost-benefit analyses were called for in other than exceptional cases, the inevitable delays would likely negate the Commission's other recommendations aimed at expediting approval procedures - an outcome which would result in the exact opposite of what the Commission seeks to achieve.
A full reckoning of anticipated costs and benefits is likely to be an expensive and time-consuming path to go down, and the Commission would not advocate such a full cost-benefit approach, except in rare and clearly contentious cases.

An important requirement for rational decision-making is the availability of accurate information on the costs and benefits of alternative land uses. Governments can play an important role in gathering information on the basis of which society can make informed decisions (and which no individual would have an incentive to collect).

The Commission supports the development of environmental and ecological databases by both Commonwealth and State Governments. Equally, however, there is a need for access to information on mineral resources. The Commission therefore recommends that access to land for exploration - a necessary precursor to gaining such information - be generally permitted (subject to appropriate safeguards).

Section 9 of Volume 3 contains a detailed discussion of environmental impact analysis as currently practiced in Australia and how it might be improved.

**Other approaches could be tried**

Between the extremes of relying solely on market forces and on governments to make rational land-use decisions lies a range of possible mechanisms for resolving such conflicts. One which combines elements of both approaches is through government-imposed negotiation. A practical example of how a negotiation approach to resolving public land-use conflicts might work is illustrated by the bargaining process leading to the establishment of conservation reserves in the Northern Jarrah Forest of Western Australia (see Box 4.2). While this process may not necessarily have resulted in the most socially efficient use of resources, it at least indicates that trade-offs between development and conservation objectives can and will be made when parties are faced with a system which encourages them to do so (as would be the case under market-based approaches).
Box 4.2: Resolving multiple land use conflicts by negotiation: the Darling Natural System

In 1972, an area of Jarrah forest in Western Australia was designated by the Conservation Through Reserves Committee as one of twelve 'natural systems' in the State. In addition to conservation and recreation value, however, the area also contained significant bauxite deposits. The resolution of this land-use problem involved a series of committees, public submissions, and subsequent consultations and negotiations by working groups of the main protagonists. Alcoa claimed that often only a relatively minor excision from 'buffer zones' provided access to substantial tonnages of ore. In other cases, the initial boundary was a convenient reference line (eg a road) rather than an ecologically significant feature (eg a catchment divide). Alcoa considered that a spirit of consensus was crucial, suggesting that the successful negotiating outcome required Alcoa's acceptance that conservation was a priority land use for a significant proportion of the principal bauxite area; but also an acceptance by the conservation movement that boundaries based purely on conservation criteria needed to be reviewed and adjusted on the basis of a joint appraisal of relative ecological and resource values.

Source: Alcoa of Australia (sub. 16, pp.4-6)

In summary, there is a variety of initiatives open to governments in Australia to improve existing means of resolving public land-use conflicts.

In the Commission's view, possibilities for employing market incentives should be pursued wherever feasible, in preference to reliance on governments to resolve land-use and related conflicts.

Because influence over land-use decisions transgresses jurisdictional boundaries, comprehensive reform will require intergovernmental co-operation. The Commission recommends that a number of matters currently impeding efficient use of the nation's natural resources - such as conflicts arising from the use of Commonwealth power over the States on environmental and land management issues (eg World Heritage listings) - be addressed in suitable forums. (In this respect it notes the agreement reached at the Special Premiers' Conference in October 1990.)

4.6 Should mining be prohibited altogether on certain categories of land (eg national parks)?

Since mining involves disturbance to the land surface, it is often seen as posing difficulties in terms of compatibility with other land uses. An analogy put by some participants was that mining and some public uses of land (eg national parks) were like oil and water - they don't mix. Thus the Environment Centre of the NT Inc stated (sub. 126) that it:

... would like to stress from the outset that mining and national parks are incompatible land uses ... If land is to be managed primarily for nature conservation, it follows that activities which could compromise or negate this objective are incompatible uses.
DASETT (sub. 65, p.12) noted that:

Despite AMIC's claim that restrictions in land access is a 'problem', these restrictions (eg aboriginal lands, conservation and heritage areas, some private land, urban and other government land) have been placed to protect areas assessed as having land-use values greater than that of its mineral prospectivity. There may of course be questions about the appropriateness of these assessments, and that is an issue which may need to be pursued.

Several participants did indeed question the appropriateness of these assessments, including whether any such assessments had been made at all (or even the issue addressed in a sensible way). For example, BHP submitted (sub. 67, p.6) that:

Whatever method of independent assessment of land use is chosen, we believe it is important that decision makers and the public realise that retention of land in its unmined, virgin state is not a costless exercise for the community. The cost is the contribution to GDP, export revenue and employment forgone, ie the general contribution to material standard of living forgone. The community needs to be made to face that cost, either each member individually or else via an objective investigation acting on its behalf, and to make its decision in full knowledge of that cost.

Moreover, the cost needs to be considered in a comprehensive way. The cost of not developing any one particular mining project may well be acceptable to the community. But there may be a different view about the total cost of not developing any such projects. Yet the question is usually put to the community (to the extent that it is put in any rational way at all at present) on the basis of individual projects; the community does not have an opportunity to express its view on the wider issue.

In similar terms the Victorian Chamber of Mines (sub. 21, p.4) argued that:

Federal and State governments should adopt policies requiring equally stringent criteria and open inquiry to be applied to continuation of existing or approval of new exclusion areas, as is required for natural resource development interests.

Stockdale stated (sub. 43, p.5) that:

If a mineral explorer does locate an orebody in a park he will obviously wish to exploit it, but the decision whether or not to grant a mining lease and on what terms then falls, appropriately, to the State government. This is where the techniques of cost-benefit analysis can be utilised to achieve a rational decision.

The uncertainty as to the status of various categories of land with respect to their availability for exploration or mining has led to an active debate about the precise proportion of Australia's land surface which is either potentially subject to exploration or mining, or legislatively (or effectively)
immune from these activities. In the Commission's view, this is a rather sterile debate. Not only
does it overlook the important fact that it is often the same small percentage of land which is valued
highly by both miners and by conservationists, it distracts from important issues such as what
restrictions should apply to particular land-use categories (eg national parks)?

The Commission's view is that the differing costs and benefits of exploration and mining should be
recognised in restrictions on access to national parks and other similar areas. The real debate
should be about the net benefits generated by alternative land uses, irrespective of their location on
the continuum between national parks and cities. There would be overall benefits to Australia from
an approach which recognised these trade-offs. The following discussion examines the
implications of such an approach for national parks, National Estate and World Heritage listings.

**National parks should not necessarily be sacrosanct**

With some exceptions (notably recently WA), exploration and mining is generally prohibited in
national parks (or only allowed subject to approval by both Houses of Parliament of the relevant
legislature). An indication of the nature of present restrictions applying to national parks and to
other nature reserves and similar land in Australia can be gained from examining Table 6A.1 in
Attachment 6A of Volume 3. Even where exploration or mining is possible in theory, political
realities suggest that such activities are likely to be rare events in practice.

As an example of this, the Australian National Parks and Wildlife Service (ANPWS, sub. 83, p.9)
noted that while Section 10 of the National Parks and Wildlife Conservation Act (NPWC Act)
totally prohibits exploration and mining in Kakadu National Park, it does allow for such operations
in other parks and reserves if:

- there is a plan of management in force;
- this plan specifically permits such operations; and
- the Governor-General has approved those operations.

In practice, none of the plans of management for parks and reserves declared under the NPWC Act
allow for exploration or mining to take place. The ANPWS considered (sub. 83, p.10) that this
"reflects the fact that the primary purpose of the Act is to protect nature conservation values,
promote Aboriginal interests and encourage tourism, not to facilitate mining". Given that the
"Commonwealth Government has a policy of not allowing mining in national parks"
(Commonwealth of Australia 1990), there must be serious doubts as to whether the Section 10
provisions will ever be used to permit mining in Commonwealth-declared national parks.

A number of participants in this inquiry argued that current procedures for declaring national parks
did not allow for a proper assessment of mineral resources or, indeed, biological or other natural
resources to be made. A common view was that of AMEC (sub. 15, Appendix 4, pp.2-3) which
contended that:

It is clear that in the past, the definition of National Park boundaries has been imprecise and,
in some cases, the area embraced has obviously not been surveyed scientifically either for
conservation worth or to define whether or not community resources which might be needed
in the future, were being quarantined ... The process of establishment of National Parks is
becoming increasingly politicised so that, in effect, such distortion in Government decision making is now so evident as to raise the question of whether the process is genuine, particularly in respect of the huge areas which are currently being allocated without a corresponding allocation of public funds to ensure their adequate management, or any attempt to adequately survey the mineral resources in the public interest.

Exploration and mining is also restricted (or sometimes prohibited) in various other categories of reserves. This varies widely across land-use categories and across legislatures. In many cases the effect of land status on mining and exploration is not defined in the legislation, but is determined by administrative practice (or only becomes defined when exploration or mining in the area becomes an issue). Box 4.3 relates Shell's experience in relation to the Douglas-Aspley area of Tasmania.

Box 4.3: The Douglas-Aspley area of Tasmania

Between 1978 and 1984, Shell Australia invested considerable funds in exploration in the Douglas-Aspley region of Tasmania and discovered a black coal deposit which almost doubled Tasmania's known black coal resources. In 1987, the Tasmanian Liberal Government decided against declaring a National Park over the area but instead agreed that the area should be retained as a State forest. A Management Plan was developed under which exploration and mining were permitted within the State forest. In early 1989, the Douglas-Aspley area was listed in the Register of the National Estate under the Australian Heritage Commission Act. Shell was advised that this would have no effect on the existing retention Licences or on the granting of a Mining lease. However, in late 1989 the Tasmanian Government declared the area a National Park. According to Shell, it was not consulted prior to the declaration of the National Park, nor has it been able to establish whether or under what conditions it will be able to explore or mine in the area.

Source: Shell Company of Australia (sub. 66, pp.22-3)

Existing national parks have sometimes been declared without any assessment having been made of the area's mineral potential and without a convincing case being made that the entire area must remain immune from other potential land uses (such as mining). In the Commission's view, existing and proposed national parks should be subject to assessment of relative costs and benefits of such a declaration. This will generally mean permitting exploration and evaluations of other potential land uses. Objective assessment of relative values of alternative land uses to society would also, in the Commission's opinion, require distinguishing between core ecological areas and buffer zones, and between different types of activity (eg exploration versus mining).

A practical example of how this approach could be implemented is provided by adoption of the 'regional reserve' land classification in South Australia (see Box 4.4).
Box 4.4: Resolving land-use conflicts: the regional reserve concept

The SA Government has challenged the assumption that mineral exploration and development and conservation of nature on the same land are mutually exclusive by introducing a new reserve classification - the regional reserve - under the State's National Parks and Wildlife Act 1972. This classification allows the government to reserve any specified Crown land for the purpose of "conserving any wildlife, or the natural or historic features of that land while, at the same time, permitting the utilisation of the natural resources of that land". The Innamincka Regional Reserve in the far north-east of South Australia was created after lengthy negotiations between the government and various parties with interests in the resources of the area, which include wildlife, historical interest (eg Burke and Wills), sites of Aboriginal significance, pastoral runs, and extensive hydrocarbon gas deposits (the Cooper Basin is now the largest on-shore oil and gas resource in Australia, supplying gas to Adelaide and Sydney markets and exporting petroleum products). At the same time, previously uncontrolled tourist activities are now managed under the powers of the National Parks and Wildlife Act and associated regulations, and increasing numbers of tourists are visiting the area.

Source: South Australian Department of Environment and Planning (sub. 2, p.2) and South Australian Chamber of Mines (sub. 132, p.19)

Further discussion of the regional reserve concept and its application in SA can be found in Section 6 of Volume 3 and in Volume 4, 'Conflict over the use of public land'. A number of participants, including several State governments (eg NSW) commended the regional reserve concept as a useful model for other States to follow.

The Commission recommends that governments in Australia consider adopting the South Australian regional reserve concept as a way of distinguishing between core ecological areas and areas of lesser fragility or importance.

Further discussion on exploration and mining in national parks is at Attachment 6A of Volume 3.

National Estate listings are causing problems

Established in 1975, the Australian Heritage Commission (AHC) advises the Commonwealth Government on the protection of Australia's National Estate by, inter alia, preparing and maintaining a Register of National Estate places. The National Estate is defined under the Australian Heritage Commission Act 1975 as those components of the natural or cultural environment of Australia which "... have aesthetic, historic, scientific, or social significance or other special value for future generations as well as for the present community". According to the AHC (sub. 24), there are now about 8800 places on the Register and about 230 on the Interim List. These lists are seen by the AHC as "an alert to planners, decision makers, researchers and the community at large of the heritage value of these places."

Limited protection of listed places is afforded under Section 30 of the Act, which provides that no Commonwealth Minister or agency may take any action that adversely affects a place in the
Register, unless there is no feasible and prudent alternative. They are also required to inform the AHC of any proposed Commonwealth action which might significantly affect a place in the Register. Although Section 30 applies only to agencies of the Commonwealth Government (and not to State or local governments or private individuals), the provisions of Section 30 may nevertheless impinge on these parties indirectly. Of particular relevance to the mining and minerals processing industries are the effects of the heritage provisions on Commonwealth decisions on export and foreign investment approvals, and on international treaties.

Anyone may nominate a place for the Register, and there are no requirements to consult or seek agreement from any other body or person before making a nomination. According to the AHC (sub. 24):

Nominations for the Register of the National Estate are assessed solely on the basis of national estate value. Other attributes, such as economic values, are not relevant to national estate significance, and so are not considered in the assessment process.

These assessments are undertaken by bodies of experts. Any person may object to, or comment on, a proposed listing. Such objections are reassessed by experts utilising the same criteria.

The Commission acknowledges that the historical preservation of certain places is of value to the community. It is also recognised that the unequivocal legal position is that National Estate listing merely 'flags' the existence of certain values of a place and that heritage values are only one of many other values (eg economic) which are taken into account when decisions are made on land use for these areas. As noted by the Australian Heritage Commission (sub. 206, p.2), mining is currently taking place in National Estate areas.

Despite this, the popular and public perception remains one of viewing National Estate listing as a land-use decision-making process. That is, places listed on the National Estate are often treated as if they have been through a land-use decision-making process which has considered the value of alternative uses. The Tasmanian Chamber of Mines, for example, noted (sub. 221, p.7) that National Estate areas in Tasmania (which, including sites on the Interim List, comprise some 37 per cent of the area of the State) are now strictly controlled by the same guidelines as apply to State Conservation Areas.

Because the very name connotes places which sound as if they should be preserved at any cost, National Estate listings can frustrate rational assessment of the likely costs and benefits of alternative uses of land.

In the interests of rational decision-making, there would seem to be a need to counteract misunderstanding or misrepresentation in public debate of the implications of National Estate listing.
In the Commission's view, the Commonwealth Government should consider renaming the Register of National Estate Places and the Australian Heritage Commission with titles more accurately reflecting their actual roles, thereby eliminating any confusion with concepts such as National Parks or World Heritage areas - which, unlike National Estate listings, are more likely to have been through a more demanding listing process which have at least taken into account other land-use values. The Commission proposes the Australian Register of Places of Interest. Failing this, there is a strong case for removing land of 'nature value' from the purview of the Australian Heritage Commission on grounds that such areas can be adequately protected by other existing mechanisms (e.g. national park declarations).

Further discussion on National Estate listings can be found in Attachment 6B of Volume 3.

**World Heritage listing processes should also be reconsidered**

Australia is a signatory to the 1975 UNESCO Convention for the Protection of World Cultural and National Heritage. Signatories to the convention commit themselves (Article 5(d)) to "take the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage". Responsibility for implementing the Convention rests overwhelmingly with the signatory states themselves.

Australian nominations are made by the Commonwealth Government, usually on the recommendation of the relevant State Government. On some occasions, however (see Box 4.5), nominations have been made without the agreement of State Governments under the *World Heritage Properties Protection Act 1983* (Cwlth) - which prohibits acts which might damage or destroy heritage property. Nominations are vetted and final decisions made by a 21 member World Heritage Committee on which Australia serves. To qualify for listing, a property must meet at least one of several criteria for outstanding universal value (refer Attachment 6C of Volume 3). There are currently eight Australian places on the World Heritage List.

The Queensland Chamber of Mines (sub. 74, p.34) considered that the tropical rainforests of Far-North Queensland are an excellent example of how 'legitimate' mining operations can be caught up in World Heritage listing wrangles (refer Box 4.5). The merits of listing this area as a World Heritage site is not an issue on which the Commission wishes to comment. Box 4.5 does, however, clearly illustrate some problems with the procedures surrounding such nominations, particularly relating to the extent to which alternative land uses are considered and objectively evaluated. Pasminco Ltd (sub. 89, p.77) cited Tasmania as another area where World Heritage nomination was proceeding without proper account being taken of the economic costs or benefits of segregation. Oakbridge Ltd (sub. 32, p.34) suggested that World heritage listings be referred to the RAC for consideration.
Box 4.5: World Heritage listings: the rainforests of Far-North Queensland

In 1987, the tropical rainforests of Far-North Queensland were nominated for World Heritage listing by the Commonwealth Government. At the time, there were 38 Authorities to Prospect valid in the area within the proposed boundaries. The Queensland Chamber of Mines said it would support the concept of World Heritage listing provided the rights and responsibilities of existing tenure holders were protected, and the area nominated was confined to the virgin rainforests of first priority scientific interest and value. According to the Chamber, the Government accepted boundaries "put forward by conservation groups which took no account of any such factors". Despite urgent representations to the Minister for the Environment and the fact that no ban was officially placed on exploration or mining, the companies received no satisfaction as to whether they would be able to proceed if the nomination was successful. It was made clear, however, that no compensation was due or payable under World Heritage legislation. The Chamber alleged that within 12 months all exploration activity had ceased, and subsequently about half of the holders of Authorities to Prospect 'walked away' and wrote off their investments. Others are still waiting, three years later, to find out whether they will be allowed to operate under the auspices of the Federal/State Management Authority which is only now being set up.

Source: Queensland Chamber of Mines (sub. 74, pp.34-5)

While protecting places of world significance is laudable, present listing procedures do not adequately allow for the values of alternative land uses to be taken into account.

In the Commission's view, there is a strong case for changing the procedures applying to Australian nominations for World Heritage listings, with the aim of ensuring that the values of all alternative land uses are adequately taken into account. Important in this regard is public input into some form of evaluation (eg Resource Assessment Commission inquiry) and the payment of compensation (by the Commonwealth Government as the proposer of the nomination) to individuals/companies or State/Territory Governments which may suffer demonstrable loss as a result of a listing proceeding, and a requirement that nominations be accompanied by a draft management plan to provide more certainty to landholders. Such reform would clearly require co-operation between State/Territory and Commonwealth governments.

4.7 How should conflicts between miners and other private landholders be resolved?

Another major area of conflict arises from the rights (or lack thereof) of private rural landowners and leaseholders and the rights of companies to exploit mineral resources belonging to the community. Conflicts have also arisen between miners and urban landholders. (A detailed discussion of these issues is at Section 5 of Volume 3.)

In parts of Western Australia and in respect of certain 'improved' land in other States, State mining legislation provides a power of veto to farmers over exploration activity. Generally, however, no right of veto exists, but compensation (determined by Wardens' courts) is payable to landowners/landholders. Both mining and rural interests have argued that existing legislation is inadequate and does not allow for best use to be made of both mineral and rural land resources.
For their part, mining interests complain that the power of veto often applying to land merely because it is classified as 'agricultural' unnecessarily restricts access to resources below the surface (which are the property of society in general), either by the absolute refusal of the landowner to allow access or through the prolonging of negotiations because the landowner attempts to win payments based on the value of the mineral resources, rather than the value of the land itself. For example, AMEC (sub. 15, pp.25-6) claimed that the provisions for land access under the WA Mining Act:

... have delivered into the hands of the Private Landholder, for all practical purposes, an effective 'veto' ... These provisions allow an infinite variety of tactics to be effectively employed by private landholders wishing to prevent mineral exploration programmes from proceeding. The agricultural community which holds the greatest proportion of the alienated land, has used the provisions of the Act in an aggressive manner and have virtually ensured that ... the entire Southwest Land Division of Western Australia has effectively remained unexplored.

Agricultural interests, on the other hand, argue that once permission to explore (if required) has been given, miners have in the past tended to run 'rough-shod' over rural properties. The Commission received anecdotal evidence of such instances (see Volume 4, 'Examples of conflict between explorers/miners and private rural and urban landholders'. The main areas of concern to landholders appeared to be lack of a power of veto, difficulties in receiving full and proper compensation for disturbance or damage, lack of prior notice of exploration or mining, and insufficient protection of development or improvements on private land (eg buildings, land under cultivation etc) from mining because of insufficient protective distances specified in legislation.

The Commission also received anecdotal evidence of conflicts between mining and urban landholders. For example, P. J. Denovan (sub. 125) highlighted a number of concerns relating to mining activity at Bouldercombe, a rural town in Queensland. These included financial burdens associated with pursuing objections through the lease application system, the granting of leases to speculators, abuse of water regulations by miners, and inadequate storage and treatment of processing waste.

Under common law, private landholders generally have the right to use their land as they see fit. These rights are compromised, however, where others wish to explore or mine on that land. Explorers and miners also have certain rights of access to such land under State Mining Acts. Finally, property rights to minerals rest with the Crown (see Section 2 of Volume 3).

This combination of property rights can result in conflicts and also in inefficient use being made of society's scarce natural resources. For example, in those States where landowner veto does not apply, and where there may not be adequate provision for compensation and other rights of landholders, miners may be able to undertake exploration or mining without regard to the costs they are imposing on others (eg farmers or urban residents). This may be inefficient from the community's point of view because it could lead to exploration or mining on land which would yield greater wealth in alternative uses (eg agriculture). Similarly, however, a right of veto may allow a farmer to deprive the community of the benefits of exploiting community-owned resources without bearing any of the costs of doing so.
Land-use conflicts between miners and private landholders reflect problems with the way property rights to land and minerals are specified.

This suggests that the solution to these land-use conflicts is to specify property rights in such a way that the costs and benefits of individuals' actions are taken into account in their decision making. Combining mineral and land ownership would, in principle, solve many of these problems - although in practice it may be less effective in some cases (e.g. because of the potentially prohibitive costs of an explorer having to negotiate with numerous landholders in order to gain access to large tracts of land to make exploration worthwhile) (see Chapter 2).

Failing vestment of mineral rights with landowners, an alternative approach is through legislative reform aimed at better allowing relative values of alternative land use to be brought to account. In particular, legislation should enable landowners to be fully compensated for loss suffered as a result of exploration or mining on their land. The establishment of pro-forma access agreements and codes of conduct (along the lines of those adopted recently in NSW), may also yield benefits by more clearly defining the rights of the affected parties and by reducing the costs of negotiating mutually satisfactory arrangements. The NSW Government (sub. 217, p.11) noted that, since the provisions commenced seven months ago, no negative responses had been received and that only one request for the appointment of an arbitrator had been received, suggesting that the scheme is functioning well.

There is a good case for reviewing existing legislative arrangements covering landholders affected by explorers/miners wishing to exercise mineral rights, where this has not already been done. Important issues to be resolved by such a review include the circumstances in which compensation would be payable and formal access arrangements (including codes of conduct). The arrangements now operating in NSW would seem to provide a useful model for the other States to consider.

4.8 Should any more uranium mines be permitted in Australia?

The uranium industry in Australia is subject to a number of government interventions which do not apply to other mining and mineral processing activities. The most important of these is the Commonwealth Government's 'three mines' policy. Public debate on the reasons for this policy tends to revolve around two arguments: environmental/safety concerns; and the likelihood or otherwise of market opportunities emerging based on the long-term balance between the supply of and demand for uranium. (A more detailed discussion is at Section 23 of Volume 3.)

Environmental and safety concerns

Uranium is a highly radioactive material. Because of this there are major concerns for workers' health and for the environment during the mining of uranium and with its use in electricity generation. Even more serious concerns relate to the use of uranium in the manufacture of nuclear weapons. (Australia is a member of the Treaty on the Non-Proliferation of Nuclear Weapons, which attempts to ensure that uranium is used for peaceful purposes.)
With growing concern about potential 'greenhouse' effects and problems of acid rain caused, in part, by emissions from coal-burning power stations, uranium is seen by some as a potentially less-polluting form of energy generation. World production and trade in yellowcake (uranium oxide) will continue with or without Australian participation.

Environmental concerns about the potentially hazardous nature of uranium and its products are clearly justified. Nevertheless, if the Government is satisfied that existing mines operate safely within the strict environmental guidelines that currently apply, there is no reason to suppose that new mines could not be just as safe operating under similar guidelines. From a world perspective, a uranium mine that is regulated and operating under strict environmental controls in this country may be far more desirable than one which is operating under lax environmental controls elsewhere.

**Market outlook rationale makes little sense**

Government intervention in the industry is also defended on the grounds that the nation can benefit from strategic participation in the world market for uranium in a way which would not be possible if Australian producers were to compete in an unco-ordinated fashion. Thus, it is argued, restricting the number of Australian producers may enable Australia to exploit its market power by raising prices, or alternatively to avoid unnecessary duplication and waste that might occur if Australian producers competed amongst themselves in the face of a world market where supply considerably exceeded demand.

The first part of this rationale relates to a scenario of buoyant demand whereby Australia may be able to take advantage of monopoly power. Thus, by restricting market supplies via its three mines policy, the Government may have sought to achieve and maintain an artificially high price for uranium. Furthermore, the Government has maintained a 'floor price' policy which prohibited the sale of Australian yellowcake below a set price. The 1977 policy held the price at $US30.50 per pound (which effectively held the price for Australian yellowcake above the then prevailing world price). A more flexible policy was introduced in September 1989, which allows Australian producers to negotiate contract prices, but with a requirement to demonstrate that they are in line with the market. These developments suggest that government attempts to force the price of uranium up by restricting supply - if that was the intent - have not been successful.

In the face of a more depressed world uranium market in recent times, arguments for government intervention have taken a slight twist. It is now often argued that future demand for uranium will not be sufficient to support more than the currently operating mines. Accordingly, it is inferred, no more mines should be permitted to open lest the investment in the existing mines be 'wasted'.

A major problem with this argument is the inherent difficulty of anticipating long-term demand. Estimates presented to this inquiry varied widely (see Table 23A.1 in Volume 3), depending upon assumptions made relating to factors such as variations in economic growth rates, changing energy intensities of production, technological change, sanctions against South Africa, developments in eastern Europe and general world environmental concerns. Interestingly, forecasts of high future
demand were made by companies with claims to existing undeveloped uranium deposits in Australia (eg Pancontinental Mining Ltd, CRA Ltd, and Denison Australia Pty Ltd), forecasts of low demand by environmental groups such as Greenpeace Australia, the Friends of the Earth (Sydney), and the Environment Centre of the NT, and forecasts of steady demand by one of the existing Australian producers, ERA. Greenpeace (sub. 25, pp. 5-6) was led to observe:

Predicting uranium supply and demand has been as much a political exercise as a technical or economic one, 'political' both in terms of conflicting positions in relation to the desirability of developing nuclear power and in terms of conflicting perspectives and interests within the uranium mining and nuclear power industries.

Given this, the efficacy of a policy based on a particular (low) forecast of future demand must be considered highly questionable. Governments the world over have shown an inability to read markets accurately and there is little evidence that the Australian Government can do any better.

Even if market demand estimates turn out to be correct, there is little evidence that any new Australian uranium mines would displace the existing Australian producers at Roxby Downs and Ranger. According to estimates presented in Attachment 23A.1 of Volume 3, Ranger is the eighth lowest cost world producer, whilst Olympic Dam is ranked twenty-two. It seems unlikely that any new Australian producers would capture the market shares of either of the existing producers, but highly feasible that they would displace existing or potential producers in other parts of the world. Furthermore, there is no reason why existing domestic producers should have a safety net provided by government to protect them from domestic competition.

One effect of existing prohibitions on uranium mining is that Australia may be forgoing substantial additions to national income. The Uranium Information Centre (sub. 17) submitted that the result of the three mines policy had been that:

With approximately 10 per cent of world reserves of uranium, and government support for the development of mining and milling, Canada has 30 per cent of the world market. Australia, by comparison, with close to 30 per cent of world reserves and an ambivalent attitude on the part of government for the past 18 years, has only 10 per cent of the world market!

The Centre (sub. 17) also reported estimates that under the current policy the Australian uranium industry is forgoing potential revenue of approximately $A750 million per year and that cumulative losses in export earnings during the 1980s amounted to around $A4.5 billion. While these estimates overstate the value of a bigger uranium industry in Australia (for example, by quoting gross rather than net figures), there can be little doubt that Australia is paying a significant price for its 'three mines' policy.

General supply and demand pressures ultimately determine what happens to the world uranium market. The Commission considers that it should be left to the market to determine who is a viable producer. The Commission also considers that there are no persuasive reasons why other uranium mines could not operate under strict environmental controls which currently apply to existing Australian operations.
The Commission recommends that the `three mines' uranium policy and any controls on prices be abandoned so that there is no restriction on the number of uranium mines in Australia. The Government's intervention in the industry should be limited to ensuring adequate safeguards with respect to the mining, processing, transport and use of uranium.
5 MINE DEVELOPMENT

Lead times between gaining mine approval and bringing a mine on stream can involve many years and considerable capital expenditure (in mine development and putting in place other necessary infrastructure). Current government interventions affecting this stage of a mining project add unnecessarily to delays and therefore to costs. This chapter examines these problems and canvasses possible solutions.

Expenditure on social and industrial infrastructure can account for a large proportion of total project costs and involve outlays which can occur many years before any revenues are generated by mineral sales. Mining projects require substantial infrastructure, particularly in remote areas where housing and transport links are usually non-existent. Industrial infrastructure (such as plant and equipment, water, energy and transport facilities) are needed as part of the production and marketing chain, while social infrastructure (including housing, town water supply, health and education services) is necessary to support the workforce - unless a fly in, fly out operation is planned (in which case much less in the way of social infrastructure is needed). MIM Holdings Ltd reported (MIM sub. 19, p.3) that mining companies in Australia have built 24 towns, 1900 kilometres of railway track, 12 ports, and more than 20 airfields, along with necessary dams and power stations. MIM itself has spent over $2 billion in the last decade on coal mines, townships, ports and railways. Around $750 million was reportedly spent at Roxby Downs over 13 years before production began, while construction costs for the Ranger uranium mine have been estimated at $338 million (including $64 million for the town of Jabiru).

Who should pay for industrial and social infrastructure which may be required to support a mining operation? Are construction costs in remote sites unnecessarily high? Do interventions by government - such as foreign investment regulations - impede access to capital for financing mining projects? Is mine development and construction treated unfairly by the tax system? This chapter addresses these questions.

5.1 Who should pay for infrastructure and are such costs unnecessarily high?

In keeping with the terms of reference for this inquiry, the benchmark for answering these questions is the effect on the efficient use of the economy's resources. However, because the benefits of infrastructure are not always confined to the mine, the debate often focuses primarily on the 'fairness' of cost-sharing arrangements.

In general, there is an incentive for developers to provide all necessary infrastructure because without it there would be no mineral revenue. A developer will be prepared to incur the cost of infrastructure if the net present value of mineral revenue exceeds the net present value of associated capital and operating costs (including an adequate return on investment).

The bulk of necessary infrastructure is usually dedicated to the project: for example, transport facilities (railways, ports and roads) and townships and supporting services (electricity, water and sewerage). If the developer calculates that it will be profitable to provide the infrastructure - and there are no offsetting costs or benefits to other persons or activities - then such outlays represent
an efficient use of the economy's resources. There is no necessary obligation of government to provide these directly or assist with financing because they are an integral part of the resource cost of committing productive effort to such activities and regions.

However, there are some items of infrastructure (for example schools, health facilities and police stations) which are ordinarily provided by government and which are for the benefit of the community at large rather than being specific to development projects. If the developer is compelled to provide these facilities, whereas elsewhere they are provided by government, then the project is penalised. In effect, there would be a distortion in investment incentives which had the effect of penalising mining (just as if there was a tax on mining activity but not on competing investments). This is inefficient.

It can also be inefficient if infrastructure is not provided by a developer because it is considered not privately profitable, but there would nevertheless be net benefits to the economy if it were built. For example, a port may be too costly for one developer but, if built, it may be used for shipping other goods. In such circumstances, if the port does not go ahead (eg because privately developed ports are not permitted) it would represent a case of ‘market failure’. Faced with such a situation, the government could decide to provide the infrastructure (or assist the developer in providing such infrastructure) with a view to recouping contributions from other port users subsequently. The problem here is to identify genuine examples of market failure where intervention by government will lead to net benefits of sufficient magnitude to justify that intervention.

The potential for mine-associated infrastructure to generate external benefits is the basis for many proposals for sharing the costs between the developer and the government. Such external benefits vary widely: a port may be used to ship other commodities; a rail line may reduce heavy vehicle activity on already crowded roads; a mining town may eventually expand to become a regional focus not solely dependent upon the original mine. Should such potential externalities affect the financial responsibilities of the developer and the government?

A role for government provision of infrastructure was also argued for other than on the basis of sharing of benefits. For example, it was suggested that if the government initially provided infrastructure, and recouped the cost from the developer over time, there would be advantages (because it would help project cash flow and because governments can usually borrow at lower interest rates). However, there would be offsetting costs of such an approach, including risks to public funds, the likelihood of cost overruns because of inefficient public supply of infrastructure, and the possible need for ‘take-or-pay' contracts.

The degree of financial responsibility assumed by the developer and the government has varied considerably among States and over time. Recent policies are relying more on the criteria of sharing of benefits and separation of responsibility for industrial and social infrastructure than was the case with past policies (which were heavily influenced by state government budgetary positions and the use of infrastructure as a state development instrument). These moves are in the right direction.
However, while infrastructure financing policies are becoming more rationally based, many problems continue to exist in this area. For example, there is scope to reduce existing uncertainty of how much a developer will be required to contribute to infrastructure costs, as well as scope to relate such contributions more closely to actual costs. Because each project is unique in its infrastructure requirements, it is impossible to specify a 'formula' which gives a clear basis for planning. However, the negotiation stage currently appears to be highly dependent on the relative bargaining power of the parties.

In the Commission's view, mine developers should pay for industrial and social infrastructure necessary to enable mineral revenue to be earned. However, governments should pay for social infrastructure normally provided publicly - such as health, education and law enforcement. Where the provision of infrastructure by mining companies will benefit others (but is not privately viable), there is a case for requiring a contribution from other beneficiaries (or by governments on their behalf).

(Further discussion on the provision of infrastructure is at Section 15 of Volume 3.)

5.2 Are construction costs in remote sites unnecessarily high?

The Commission was specifically asked to consider the issue of construction costs in remote areas. The limited information made available to the Commission during this inquiry indicates that it can cost a great deal more to construct a project in remote locations than in more developed areas (see Attachment 15A of Volume 3). In the main, however, this appears to simply reflect the large distances between construction sites and supplies of goods and services they require (eg the need for larger storage facilities and other on-site services to cope with less frequent and less certain deliveries; the increased transport cost of materials used in construction; and high wage premiums required to encourage people with the necessary skills to relocate in remote areas). Those components of construction costs which may be unnecessarily high because of impediments under the influence of governments (eg some transport and labour costs) generally account for only a small proportion of the higher costs of remote-site construction. These issues are being considered in detail in the Commission's concurrent inquiry into Construction Costs of Major Projects (due to report by 18 April 1991).

It is only to be expected that construction costs are higher in remote sites because of distance-related costs. However, labour market characteristics and construction industry inefficiencies may add unnecessarily to costs.

5.3 Do interventions by government impede access to capital for financing mine development?

The mining industry requires considerable capital to develop mines and associated facilities. The Australian Bureau of Agricultural Resource Economics (1990) noted that although the mining and minerals processing sector accounted for 9 per cent of gross domestic product in 1988-89, these activities have accounted for an average of 20 per cent of new fixed capital expenditure in Australia over the last five years. Given the high capital requirements of the mining industry, government interventions in this area have the potential to significantly impede the development of the industry.
What are the effects of foreign investment regulations?

What foreign investment regulations apply to mining?

In most industries, foreign investment proposals involving $10 million or more are examined without the need to demonstrate economic benefits or provide for Australian equity participation; and are approved unless judged by the Commonwealth Government to be contrary to the national interest. The mining industry (but not exploration or processing) is, however, subject to additional controls.

A proposal for a new mining project which involves total investment of $10 million or more needs Foreign Investment Review Board (FIRB) examination and will be allowed to proceed, as a general rule, only if it is not contrary to the national interest and provides for a minimum 50 per cent Australian equity and at least joint Australian/foreign control. However, a project which does not meet these guidelines may proceed if it is considered to be not otherwise contrary to the national interest and the Government judges that the unavailability of sufficient Australian equity capital on reasonable terms and conditions would unduly delay development. In that event the Government will, as appropriate, seek satisfactory arrangements for the guidelines to be met within an agreed period. Proposals for the acquisition of an existing mining business with assets in excess of $5 million are normally approved where the Government judges there are sufficient economic benefits to offset any reduction in Australian ownership and control (Department of the Treasury 1990, pp.6-7).

Mineral exploration and mineral extraction ventures are treated differently under foreign investment regulations. Placer Pacific Ltd (Placer, sub. 88, p.7) believes this is inequitable, since foreign companies are invited to explore for minerals in Australia, thus using their expertise and risking their shareholders' funds, but they are not then allowed to control a project that eventuates from these efforts. Moreover, this policy can effectively discourage investment in exploration, since foreign investors are often reluctant to invest money when they are faced with the prospect of not being able to control the project if a promising orebody is found.

The current foreign investment regulations also differ depending on whether the foreign company has 'naturalised' or 'naturalising' status. A company is granted naturalised status if: it is at least 51 per cent Australian owned; the majority of members of its board are Australian citizens; and the company, major shareholders and Government agree about voting powers in respect of the company's business in Australia. For a company to become a naturalising company it must have a minimum 25 per cent Australian equity, a majority of its Board must be Australian citizens, and it must give a public commitment to increase Australian equity to 51 per cent (subject to agreement between company, major shareholders and Government) (Department of the Treasury 1990, p.14). This status allows a naturalised or naturalising company to develop a new natural resource project where it intends to proceed on its own or in partnership with other naturalised or naturalising companies or with Australian companies, without further scrutiny by the FIRB. However, naturalised or naturalising companies must notify all other proposals to the FIRB.
Finally, the application of foreign investment regulations also differs between existing and new mines. This differential treatment was seen by various participants (e.g., Australian Mining Industry Council (AMIC), sub. 95, p.11 and ACIL Australia Pty Ltd (ACIL), sub. 53, p.2) to have the potential to distort foreign investment in existing projects at the expense of new projects, thus promoting trade in existing (rather than the creation of new) assets.

Differences in foreign investment regulations for different categories of mining-related activities are secondary, however, to the main issue of whether there should be regulations for mining which differ from those applying to most other economic activities.

*What are the arguments for having special foreign investment controls over mining and how valid are they?*

Mineral resources are owned largely by State and Territory Governments, on behalf of the Australian people, and are considered to be part of the national 'birthright' which exists for the benefit of all citizens (See chapter 2 and Section 2 of Volume 3). The current rationale behind the imposition of foreign investment regulations is "to ensure that the benefits from the development of Australian mineral resources flowed in significant measure to Australian interests" (Treasurer 1988).

The Commission views foreign investment regulations as an indirect method of ensuring that the Australian community benefits from Australia's mineral wealth, and considers that royalty and tax systems are more appropriate mechanisms for securing such returns. In this regard, it is pertinent to note that, in 1988, the Commonwealth's reason for removing the foreign investment regulations governing new oil and gas developments of over $10 million was the introduction of a resource rent tax for offshore oil and gas, and a resource rent royalty for onshore oil and gas (Treasurer 1988). The foreign investment policy was then seen to be a "redundant restriction" since reform of the charging system was now expected to ensure that adequate returns were accruing to Australia from exploitation of her indigenous oil and gas resources.

Another rationale sometimes used to support foreign investment regulations in the 'national interest' is that they act to restrain overseas companies from engaging in transfer pricing strategies so as to artificially manipulate profits earned from their Australian operations. There are several vehicles available to transfer profits to 'low-tax' havens (including management fees, intercompany royalty payments for access to parent development technology and computer systems, marketing fees, artificially high prices paid for services provided by parent companies, and artificially low prices paid for host-country products). Some argue that foreign-owned companies use such practices, since the locus of decision making often resides elsewhere (so that decisions are made with respect to maximising profit on a global instead of a national basis).

Numerous participants, for example, Alcoa of Australia Ltd (sub. 16, p.22), the Australian Coal Association (ACA, sub. 71, p.12), and CRA Ltd (sub. 73, p.98) argued that this concern was unfounded. Whilst it was recognized by various participants that the Commonwealth Government had a vital interest in ensuring that transactions between related companies are made at arms length, it was suggested by AMIC (sub. 95, p.13) that taxation scrutiny is a more appropriate policy measure for dealing with any problems of undue profits accruing to overseas interests. In
addition, ACA pointed out (sub. 71, p.13) that all producers' pricing policies are subject to the scrutiny of the Australian Tax Office since "section 136 AD of the Income Tax Assessment Act allows the Commissioner to assess additional tax on income earned by a foreign-controlled interest from the supply of goods or services to an overseas purchaser on other than an arms-length basis."

A third reason sometimes advanced for restricting foreign investment in mineral resources is a form of 'conspiracy theory'. For example, if a foreign partner also had equity in the purchaser of the raw material for further processing in its home country, then it could use inside knowledge to bargain down prices (which may also flow through to other producers of the same mineral in Australia).

Oakbridge Ltd (Oakbridge) opposed this view and gave the example of its two overseas shareholders (at the parent level), Toyomenka and Marubeni. Oakbridge stated (Transcript, pp.1048-9) that Toyomenka represented a significant buyer of Oakbridge's tonnage into Japan, while Marubeni represented a significant buyer of steaming coal from the Hunter Valley (also into the steel-mill market). However, despite the 'window' into the company held by the Japanese companies, Oakbridge believed that there was no commercial disadvantage from the relationship, because the equity positions were too small to give board representation.

While not arguing for any special encouragement for foreign investment - but rather a case for not restricting foreign interest - Shell Australia (Shell, sub. 66, p.5) submitted that foreign investors will pursue policies which are in the national interest since mining ventures tend to be large scale and long term, and foreign investors are generally large and long established companies. This means that they will be acutely aware of the need to "act responsibly with both Government and the community, and to be good corporate citizens in order to limit the vulnerability of their investment and other business activities."

Furthermore, as noted by the Treasurer, foreign investment makes a substantial contribution to the development of Australian industries and resources since:

> Capital from other countries supplements Australia's domestic savings and adds to the funds available for investment. It provides scope for rates of growth in economic activity and employment to be higher than otherwise. Foreign capital also provides access to new technology, management skills and overseas markets (Department of Treasury, 1990, p.v).

National interest arguments for differential foreign investment controls on mining are unconvincing. More direct measures (eg royalties, tax laws) exist to address any remaining concerns.

What costs are imposed by foreign investment regulations?

Although only eight mining proposals have been rejected since 1983-84 under the Government's foreign investment regulations (see Section 11 of Volume 3), this figure may understate the effect which these regulations have had on the industry. For example, four proposals were withdrawn from FIRB examination during the period, and 127 proposals were conditionally approved. Conditional approvals may impose costs through requirements to increase Australian equity over
time. Several participants such as Western Mining Corporation (WMC, sub. 69, p.44), ACIL (sub. 53, p.2), and AMIC (sub. 95, p.12) suggested that even though interference by the FIRB has been reduced, there remains an underlying perception that it may be used to intervene in relation to a controversial issue, and that the regulations impose various costs on the industry.

One such cost emphasised by ACIL (sub. 53, p.2) was the administrative and compliance cost. This represents a hindrance to investment and introduces an element of uncertainty which can be detrimental to the timely and efficient development of Australia's mineral resources. Export opportunities may be lost (possibly forever) because of delays inherent in getting government approval.

Shell (sub. 66, p.6) submitted that a cost arising from foreign investment regulations is that companies may be forced to make their investments through joint ventures. Whilst the sharing of risk, expertise and technology gathered from several sources may be appropriate for large projects, in other cases joint ventures were seen to be an inefficient and inappropriate operating arrangement which has "created imperfect partnerships, instability in project ownership and cumbersome, time consuming project management."

ACIL argued (sub. 53, p.2) that these ventures may be less sound with compulsory Australian participation because of the possibility of a higher proportion of underlying debt. Other participants such as AMIC (sub. 95, p.12) and WMC (sub. 69, p.45) also considered that the foreign investment regulations created a bias towards debt finance, resulting in mining ventures which are less resilient in the face of downturns in commodity prices.

On this wider issue of venture finance and foreign investment regulation it was argued by various participants (eg Placer, sub. 88, p.6; AMIC sub. 95, p.14; and the United Mineworkers Federation of Australia, sub. 23, p.13) that there is insufficient risk capital readily available to satisfy FIRB requirements, which therefore tend to inhibit the efficient development of the Australian mining industry.

Foreign investment regulations lead to uncertainty, delays, administrative costs and inefficient project structures (eg inappropriate joint venture arrangements). Inconsistencies between the regulations applying to different activities (eg exploration as opposed to the development of a new mine), and between different types of companies (eg naturalised and naturalising companies) can also be distortionary.

What should the Government do about foreign investment controls over mining?

The extent of foreign investment which should be permitted in the Australian mining industry has been hotly debated since the late 1960s. While it is appropriate that the Australian community receives appropriate returns from the development of publicly owned resources, the Commission does not believe that this requires the differential foreign investment regime currently applying to the mining industry. Suitable taxation and royalty arrangements are not only available, but can be structured so as not to impede the efficient development of the mining industry.
The Commission recommends that foreign investment regulations applying to mining be brought into line with those applying to industry generally.

(A more detailed discussion of foreign investment regulations is at Section 11 of Volume 3.)

**How is mine development affected by macroeconomic policy?**

During the course of this inquiry, many participants submitted that the Government's monetary policy was raising the cost of capital to historically high real rates and was significantly affecting the performance of the sector (see Section 19 of Volume 3).

Whilst the effects of high interest rates are felt by all sectors of the economy, their impact is likely to be greater on capital-intensive industries such as mining and minerals processing.

Nevertheless, the Commission considers that there is no reason to single out mining and minerals processing industries for special dispensation by insulating them from the effects of macroeconomic policies directed at all economic activities.

**5.4 Is mine development and construction treated appropriately by the tax system?**

Under Division 10 of the *Income Tax Assessment Act 1936*, mining companies may deduct for income tax purposes certain items of capital expenditure associated with mine development. These include site preparation, certain buildings (including housing and welfare buildings and storage facilities), water, light and power facilities (including contributions to State Governments for such provision), and buildings for use in certain treatment processes. Allowable capital expenditure under Division 10 is deductible by instalments over the lesser of mine life or ten years beginning in the year in which the expenditure is incurred.

Division 10AAA of the *Income Tax Assessment Act 1936* relates to capital expenditure incurred in transporting minerals and petroleum in Australia. Excluded from eligibility is expenditure on railway rolling-stock, vehicles, ships, wharves, jetties and loading equipment for which normal depreciation provisions apply. Also excluded is expenditure on transport facilities used wholly within the mine site (these being deductible under Division 10).

Capital expenditure under Division 10AAA may be written off over 10 or 20 years at the discretion of the taxpayer beginning in the year in which the infrastructure is first used. Division 10AAA is not restricted to mineral producers, but rather applies more generally to operators of mineral transport infrastructure. Further, the taxpayer incurring the expenditure does not have to own the facility.

The list of capital expenditures deductible by mining activities is unarguably more extensive than for most industries, but justifiably because many of the eligible expenditures are rarely incurred by other activities. Equally, however, to the extent that non-mining activities may sometimes incur expenses for site preparation, structures not forming an integral part of the production process
(such as storage buildings and water, light and power facilities), or transport infrastructure (such as roads within the production site) for which a depreciation deduction is not permitted, these activities are being discriminated against.
6 MINERAL EXTRACTION, ON-SITE TREATMENT AND MINESITE REHABILITATION

A wide range of government interventions affecting the 'mining' stage of the process of producing saleable mine outputs artificially alters the economics of mineral development, in the process unnecessarily imposing significant costs on the nation. Government regulation of day-to-day mining operations is counterproductive and cumbersome, particularly in the coal industry. Public provision of rail transport services (although improving) remains inefficient, while rigidities in the labour market also add unnecessarily to costs. Existing royalty systems tend to discourage mining and fail to maximise the wealth potentially associated with this activity (ie the size of the cake - as opposed to who gets how big a slice). Certain taxation provisions also distort decisions about mining activities. And inadequate incentives to rehabilitate minesites discourage socially desirable activity. This chapter examines these problems and proposes what the Commission regards as appropriate corrective courses of action.

Once necessary industrial and complementary social infrastructure is in place and a mine is operational, what is thought of as mining - the extraction of ore - can commence. The extraction phase of mining can involve anything from massive underground or open-cut operations to neatly taking the tops off iron-rich mesas. Increasingly, at least some treatment of mine outputs is undertaken on-site - so that the (semi-processed) ore shipped from mines is often in a form which can be readily traded (eg exported) or subject to further processing in Australia, depending on the economics of individual mining projects. Miners are also much more sensitive these days to the potential for mining and on-site processing activities to cause environmental damage; while rehabilitation of minesites (either progressively or at the end of the extraction phase of mining) is now widely accepted by the industry as an integral and expected part of mining.

What determines the economics of mining operations? Are labour costs unnecessarily high? Are transport costs excessive? Are energy costs too high? Are current royalty systems efficient and equitable (and if not what would constitute more efficient and equitable arrangements and how could they be implemented)? Do present tax provisions applying to mining encourage efficient resource use? Does government regulation of mining operations encourage efficient decision making? How should mining-related environmental problems be addressed? What are the incentives to restore/rehabilitate former mining sites and are they appropriate? This chapter examines these broad issues, and sets out the Commission's views on appropriate courses of action.

6.1 The economics of mining operations

Whether or not it is economic to extract minerals basically comes down to whether prices prevailing on (usually international) markets over the anticipated economic life of a mine at least cover the costs associated with getting tradeable outputs onto those markets (including an acceptable return of the capital and risks involved). This calculation is, in turn, affected by a whole range of factors - many of which are beyond the control of either miners or governments in Australia (eg the state of the world economy and the physical properties of a particular mineral discovery).
Major components of mining costs (and therefore major determinants of Australia's competitiveness in minerals) include labour, capital and energy costs, the cost of transport, royalty payments and the tax treatment of mining, costs involved in complying with regulations imposed by governments at all levels (ie federal, state and local) and costs involved in containing the environmental consequences of mining within acceptable limits. (The economics of individual mining operations, including an analysis of how changes in individual components of cost, is the subject of Appendix E of Volume 2).

Of central interest to this inquiry is the extent to which the underlying economics of actual or potential mineral projects are affected by factors amenable to influence by governments in Australia. If government interventions impose unwarranted costs, the potential profitability of mineral extraction will be undermined and individual orebodies or portions of them will become uneconomic (see Box 6.1 and Appendix E). In other words, opportunities for wealth creation will be lost. On the other hand, if governments fail to ensure that miners take into account all costs properly attributable to their operations (eg the costs of managing environmental damage within acceptable limits), the economics of mineral extraction is artificially improved - but at a cost in terms of the overall welfare of the nation.

Factors subject to influence by governments can be classified into those directly aimed at mining - such as royalties, day-to-day regulation of mining operations, and special taxation provisions - and those which indirectly affect mine costs - such as public provision of transport services.

6.2 Are labour costs unnecessarily high?

In spite of apparent capital intensity of many mining projects, labour costs account for a significant proportion of total mining costs and are therefore a crucial determinant of the viability of almost any mining operation. The issue is not so much how much miners get paid (they are in fact amongst the most highly paid workers in the country), but whether their productivity is consistent with high levels of remuneration (including on-costs).

Of interest to this inquiry is the extent to which labour costs are unnecessarily inflated because of arrangements subject to influence by governments and, if so, what might be done to overcome such problems. Indicators of the efficiency with which labour services are being utilised in an industry include the level of wage and other labour-related costs (eg on-costs of various sorts) compared with the extent of value added attributable to labour (ie labour productivity), the prevalence of unproductive work practices, and the level of industrial disputation. (A more detailed discussion of labour issues is at Section 17 of Volume 3.)
Mines have to be worked at a profit to give a return on investment and provide funds to find new deposits to supply future demand. The mineral industry is thus bound irrevocably to the concept of ore. Ore (an economic term) is mineralisation (a technical term) for which the cost of production is less than the income received for the product. Thus a deposit at one place may be classed as ore because it can be worked at a profit, but the same deposit at another place may be only mineralisation because higher mining or environmental management costs make it unprofitable to work. Increases in costs arising from changes to government policy move ore towards mineralisation. Reductions in product price have the same effect. Conversely supportive government policies, cost reducing new technologies and increases in product price can overnight convert a body of mineralisation to ore.

Source: South Australian Chamber of Mines (sub. 132, pp.7-8)

Australia's known endowment of mineral resources is divided into two classes, economic and sub-economic. The boundary between the two is not fixed and moves with world commodity prices. It is also affected by the general level of costs within Australia. World commodity prices affect all producers equally. Our level of costs, however, is higher than that of most of our competitors so that resources which are sub-economic in Australia would be economic in, for instance, Canada. Deposits of smaller size and lower grade are frequently put into production in Canada than could possibly be developed in Australia.

Source: Normandy Poseidon Group (sub. 11, p.6)

... a reduction of the copper cut-off grade at Mount Isa from 2.0 to 1.7 per cent results in an increase in the copper ore reserve of approximately 12 million tonnes (or 204 000 tonnes of contained copper metal), representing approximately 12 per cent of total ore reserves.

Source: MIM Holdings Ltd (sub. 19, p.11)

Wage costs and labour-related on-costs

Employees in the mining industry are the most highly paid of any major industrial grouping. In November 1988, average total weekly earnings of adult full-time non-managerial mining employees was 50 per cent higher than the national average. To a degree, however, this reflects costs necessary to attract labour with the required skill to the often remote locations where mining is undertaken in Australia and is of itself no indication that labour costs are excessive in relation to the contribution labour makes to value added in the industry. Typical of the mining industry view was CRA Ltd's comment (CRA, sub. 73, p.55) that:

Australian labour costs are generally competitive with those of other developed countries but they remain higher than those in developing countries which equally are our competitors.
The reference specifically asks the Commission to consider labour on-costs. Non-wage labour costs in mining were estimated to account for 13 per cent of total labour costs in 1987-88, compared to an all-industries average of 10.7 per cent (see Appendix C of Volume 2). The main factors accounting for this appear to be high severance, termination and redundancy payments (6.1 per cent of total labour costs compared to all-industries average of 2.2 per cent), workers compensation and fringe benefits tax. Whilst this may largely reflect the nature and location of the industry, there is some evidence that these costs are inflated in some cases (eg the compulsory workers compensation in the NSW coal industry administered by the Joint Coal Board - see Section 22 of Volume 3).

**Labour productivity, work practices and industrial disputation**

However, a satisfactory relative performance on overall labours costs is no cause for complacency and certainly no justification for low productivity. If we are to improve our economic position we must improve our productivity and outperform our competitors. Whilst mining industries may have high labour productivity compared to that in other Australian industries, there is little doubt that problems associated with the organisation of labour and industrial disputation adversely affects the industry's international competitiveness.

While some participants indicated that labour market inefficiencies were of major concern, very few provided details in written submissions. Oakbridge Ltd (Oakbridge, sub. 32, p.43) listed several local customs and practices operating at their mines which the company regarded led to inefficiencies, including overaward payments; differing sick leave agreements encompassing drawn-out absentee agreements; manning on draglines, shovels, longwalls and/or continuous miner units; transportation of men and materials around the mine; and cumbersome job demarcation constraints. Western Mining Corporation (WMC, sub. 239, p.13) claimed that restrictions relating to Sunday work and underground shift arrangements in Western Australia prevent the most efficient use of capital equipment and other assets. Perhaps most graphically, MIM Holdings Ltd (MIM) drew the Commission's attention to efforts to prevent closure of the Collinsville mine which, inter alia, called for an immediate reduction of 150 in its workforce to 583 whilst maintaining present production levels and other reforms to work practices to further improve productivity - which the company claimed was only 3000 tonnes per employee per annum compared with an Australia-wide average of 5300. The Commission does not consider that a general unwillingness of participants to highlight restrictive work practices in this inquiry means there are no problems in this area - indications during the Commission's industry visits and discussions were quite to the contrary. It should also be noted that responsibility for restrictive work practices should not be ascribed solely to unions and/or employees, but that a substantial part of the blame must fall to management which allowed such practices to flourish in the first place (ie during 'good times').

Labour relations in the mining and minerals processing industries have been characterised by confrontation. Coal mining in particular has by far the worst record in terms of working days lost through industrial disputes of any industry in Australia (see Appendix C). (A more detailed discussion is at Section 17 and Section 22 of Volume 3)
What should be done?

Employer views expressed to the Commission generally favoured a labour market more responsive to the enterprise needs of both employers and employees, and less dependent on conciliation and arbitration machinery imposed from outside. The Australian Mining Industry Council, in arguing for the development of enterprise-level agreements, stated (AMIC, sub. 29, p.66) that:

... central to this is the development and implementation of employee relations, practices and processes which promote enterprise-level relationships, managerial leadership and initiative, and co-operative self-regulation. This is in preference to relying upon or maintaining existing third party oriented adversarial attitudes.

The Commission considers that better relations between employees and their managers and more productive working arrangements are likely to result where conflict resolution and negotiations are more decentralised, and where third-party intervention is minimised.

In the Commission's view, award restructuring is pointing in the right direction in the mining and minerals processing industries. However, this process needs to be accelerated and implemented more rapidly and flexibly at the enterprise or minesite level. In particular, the scope of restructuring should include a review of all restrictive work practices, with workers sharing in the benefits from reform of these practices.

The Commission is also of the view that the rationalisation of unions with the objective of developing a single bargaining unit (but not necessarily a single union) in each enterprise offers significant potential gains in productivity, competitiveness and rewards in the mining and minerals processing industries.

6.3 Are transport costs excessive?

The cost of transporting minerals/material inputs from or to minesites often represents - because of Australia's economic geography - an important determinant of whether extraction is economic. The discussion here focuses on those modes of transport which are used regardless of whether further processing is to be undertaken in Australia, namely rail and road. Coastal shipping - which is generally used only if minerals are to be further processed domestically, is discussed in Chapter 7. (A detailed discussion of all transport modes is at Section 16 of Volume 3.)

Publicly provided rail transport is inefficient leading to excessive rail freight costs

Most Australian mine outputs are consigned by rail either to ports (to be exported or shipped around the coast for further processing) or direct to processing plants/end users. Rail can represent a significant proportion of fob costs in the case of exports or the value of ore delivered to the smelter/refinery in the case of ore which is subject to further domestic processing. In 1985-86, rail freight costs as a proportion of fob prices were estimated to average 15 per cent for Australian coal.
and iron ore, 12 per cent for silver-lead-zinc ores, 6 per cent for nickel, and 2 per cent for tin and copper (Freebairn and Trace 1988). Since they are a significant cost factor, if the rail costs exceed the hypothetical cost of such services presuming they were supplied efficiently, they will represent a major impediment to mining and mineral processing in this country.

Both public and private rail services are used for the bulk transport of minerals. While private rail services used to transport minerals are generally considered to be efficient, those provided by public rail authorities are generally less efficient - so that they are unnecessarily costly. Worse, rail freight rates charged by public rail authorities for many bulk commodities exceed the (often unnecessarily high) costs of providing those services.

Excess charges

Many participants claimed that State Governments in NSW and Queensland have used their position as monopoly suppliers of rail services, together with their power over licences to mine coal, to charge the export coal industry freight rates far in excess of what would represent efficient costs of supply the necessary services. Such excess charges are effectively a tax (or de facto royalty imposed) on the industry, as well as representing a significant source of State government general revenue in some states. The major impact is on coal railed to port in Queensland and NSW, but excess charges also apply to other bulk minerals despatched by rail in Australia. The Queensland Government acknowledges the existence of excess charges and that they represent a resource tax/royalty.

Excessive rail charges can lead to inefficiencies. This is because they are a disguised specific royalty (since they are usually levied on a per tonne basis) - and these types of royalties are inefficient in that, unless they are flexible (eg renegotiated whenever available mineral rents\(^1\) from a project vary), they can lead to the sterilisation of what would otherwise be economic reserves (with a consequent loss of output, employment opportunities, government revenues from income tax etc - see Appendix E of Volume 2). Of course, charging efficient rail freights - which is what the Commission would like to see - will not necessarily mean that mining companies would get to pocket the difference. A more likely outcome would be that State governments replace what is a disguised royalty (ie excess rail freights) with an explicit one (desirably an efficient one such as a pure rent royalty - see discussion on royalties later in this chapter).

Production inefficiencies

Compared with private rail operations and some bulk rail transport, the remainder of public rail freight services are highly inefficient. Passenger and non-mineral freight services are less efficient than minerals freight transport. The IAC (1989) estimated that existing public rail services (excluding coal) could be maintained with 42 per cent less labour (although it would be necessary to increase capital investment by about 14 per cent). This is equivalent to annual cost savings of approximately $600 million.

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\(^1\) Economic (or in this case mineral) rent is defined later in this chapter (see section entitled The concept of mineral rent).
What causes such inefficiencies?

MIM acknowledged (sub. 19, p.15) that while rail had a natural advantage in the movement of large tonnages, in reality, "the opportunity presented by that advantage has been seriously distorted by governments imposing mineral supertaxes disguised as 'freight' [charges] and by the rail system being protected from competitive forces by being given monopoly access to the freight market." Similarly, WMC (sub. 69, p.40) stated:

The rail transport industry in Australia is controlled almost totally by the State governments. The monopoly that the governments have in each of the States enables them to dictate the terms under which they will transport goods and the freight costs they will charge. Productivity appears to be poor.

The IAC (1989) found that major factors contributing to inefficient public rail freight services were a lack of competition (eg regulatory controls which limit competition with road transport) and non-commercial policy objectives which rail authorities are required to satisfy (including continued operation of unprofitable branch lines). The transport of 'bulk' commodities (including minerals) is often restricted by regulation to the rail system. The monopoly status of public rail services - as a result of either legislation restricting road or private rail competition, or because of an inherent natural advantage in respect of tasks calling for large quantities of freight to be moved over long distances - fosters an environment where there need be little relationship between actual costs and efficient costs, or even between charges and actual costs.

What has been done?

State rail authorities have made substantial technical and economic improvements in mineral freight operations in recent years. For example, in NSW, the State Rail Authority has announced 2 per cent reductions per annum in real (ie inflation-adjusted) coal freight rates, the introduction of volume-related rates, and moves to eliminate cross-subsidisation in coal freight rates (Graham 1990). In Queensland, the recently negotiated agreements for the shipment of base metals from the Thalanga and Lady Loretta mines indicate greater flexibility in charging arrangements.

The Railway Industry Council, which comprises representatives of rail management, rail unions, the Australian Council of Trade Unions and relevant governments, has examined ways of restructuring the industry. Its objective was to develop medium- and long-term strategies to improve the viability and competitiveness of rail. A draft of its report was released in May 1990 (RIC 1990) and the final report was presented to the Australian Transport Advisory Council meeting held in Hobart on 7 September 1990.

Finally, the Commonwealth Government has referred the industry to the Industry Commission, directing it to consider among other things - structural impediments to the development of an efficient rail industry, the cost to the industry and the economy of regulations reserving the transport of certain commodities to rail, the justification for rates charged by the relevant rail authorities for transport of reserved commodities in the context of the structure of royalties and taxes for industry, and the implications for rail services and the economy generally of charges and regulations affecting competing modes of transport. The Commission's final report is to be forwarded to the Government by 20 August 1991.
What more can be done?

Despite recent improvements in the efficiency of rail services, the evidence is that much more could be done to achieve further efficiency gains. Analysis in Appendix F of Volume 2 estimates that the effect of remaining excess rail charges and reductions in overmanning will increase gross domestic product by about $4.7 billion annually. The mining and mineral processing sector would be a major beneficiary of such reform.

In the Commission's view, the focus of reform should be on promoting competition for the supply of rail services. There would seem to be considerable scope for stimulating competition by removing restrictions on road transport and by selling rights to use rail infrastructure (eg the permanent way), with provision for those gaining access to the network to own/lease, operate and maintain their own rolling stock and locomotives if they so choose.

Road transport of minerals is competitive but does not pay its way

In general, the mining industry is not an extensive user of road transport to get mine outputs to port/delivered domestically for further processing using the public road system. A notable exception involves road transport of coal in the Illawarra region of NSW. The road haulage industry appears to be sufficiently competitive to ensure that freight rates are kept close to efficient (ie minimum) levels. The industry has a good record of providing high levels of service, and Australian long-distance road freight rates appear to represent some of the most competitive in the world.

However, in some cases where minerals could possibly be hauled more cheaply by road, there are restrictions imposed - such as the presence of agreements and legislation requiring use of rail, lack of road reception facilities at ports, and restrictions on the maximum size of road trains (which differ among States/Territories).

Although road users as a whole return substantially more in taxes which are related to road use than is spent on roads, there is evidence that heavy vehicles do not cover the cost of attributable road damage. The IAC (1989, Appendix 5) reported that the cost recovery ratio of road damage for heavy vehicles (with more than six axles) ranges from 13 to 46 per cent, depending upon assumptions about what payments should be regarded as road user charges. At the same time, small vehicles paid more than their attributable road-damage costs - with the result that heavy vehicles are cross-subsidised by other vehicles using the public road system.

Further, if prices are to more closely reflect all attributable costs then other costs - such as those relating to congestion, noise, pollution and loss of life through vehicle-related accidents - should be taken into account. These external costs can be quite significant. For example, the Consumers Transport Council (sub. 44) estimated that the full cost of coal truck activity in NSW amounts to some 6 cents per net tonne kilometre, comprising about 3 cents to cover road damage, with the other 3 cents representing external costs. This means that, while increasing freight rates to better reflect the costs of road transport would disadvantage mining activities, it would nevertheless contribute to a more efficient use of resources generally.
These issues are under consideration by the Commonwealth and State Governments as they examine the recommendations of the Inter-State Commission on road-user charges.

The Commission recommends that restrictions on competition with rail transport be abolished but that heavy vehicles be charged the full costs of using the public road system.

6.4 Are energy costs too high?

Mining and more particularly the processing of minerals into goods consumers want usually involves an energy-intensive series of processes (eg producing aluminium metal from alumina, alumina from bauxite and even producing usable bauxite from the material which is actually mined). This means that the cost of primary energy can be an important determinant of the location of these various steps (eg whether smelting/refining operations are located in Australia or the underlying economics of individual processes dictates that such `value-adding' stages will be undertaken overseas). Because it is arguably more relevant to mineral processing than to mining, the issue of the cost of primary energy in Australia and its effect on competitiveness is addressed in Chapter 7 (see Section 7.4).

6.5 Are current royalty systems efficient and equitable?

What are royalties and are they justified?

A significant cost faced by miners once extraction commences can be having to pay royalties. Royalties are payments to owners of minerals for the right to exploit them. In Australia, most royalties are paid to State and Territory governments, although there are some private royalty payments. Special arrangements also apply in respect of minerals found on Aboriginal land (see Attachment 14A of Volume 3).

A fundamental issue is the extent to which existing royalty schemes are consistent with the efficient development of mining and mineral processing activities in this country, and whether or not they are equitable (or, as argued by some participants, represent an unfair impost on the mining industry).

At the outset, it is important to stress that royalties are, or should represent, a charge for the right to exploit a resource owned by the Crown, and not a tax (even though they are often referred to as taxes - for example, resource rent taxes are examples of royalty payments). Correctly interpreted, royalties are not an unwarranted impost on miners, but are a charge analogous to payments for access to other `gifts of nature' - such as broadcasting licence fees for the right to use part of the electromagnetic spectrum and payments for fishing quotas which represent a right to take a certain quantity of fish from a fishery.

In the case of minerals, the nexus between charging and allocating rights is often broken. Mineral rights are normally allocated on a 'first-come-first-served' basis (see Chapter 3) to which an administration fee applies, with charges (royalties) levied at the time mineral resources are exploited. The allocation process confers very conditional property rights. Ownership continues to reside with the Crown and royalties are charged as part of what could be regarded as a 'leasehold' arrangement.
Some participants questioned the justification for the charging of royalties on a number of grounds. For example, it was emphasised that the mining industry makes substantial contributions to (among other things) employment, company tax revenue, foreign exchange earnings and the development of new technology - and therefore the community already obtains a more than adequate return from its mineral endowment. As a corollary, it was further argued that removing royalties may stimulate activity and result in greater gains to the economy than would be represented by the loss of royalty revenues.

Second, it was claimed that scarcity and quality rents which arise elsewhere in the economy (for example, due to limited natural resources such as fisheries and the 'airwaves' or due to regulation of entry such as taxis and some professions) are not appropriated by governments in the same way as are mineral rents.

However, these assertions do not challenge the fact that, once found, the mineral deposit is a necessary (and in this case non-renewable) input into the production process and therefore the owner is entitled to charge for its use to the extent of the net contribution it makes to overall value added generated as a result of exploiting a mineral deposit. Rather, the majority industry view appeared to be, as put by CRA (sub. 73, p.29):

Crown ownership is not disputed by CRA ... Nor do we dispute the right of the people of Australia to a reasonable return for the use of those minerals. It is the quantum of that return, and the time at which it is collected, that needs to be determined ...  

In a slightly different vein, WMC (sub. 69, p.31) that:

Crown ownership of resources provides only a prima facie case for special taxation of the mining industry; viz, it provides a necessary, but not a sufficient condition. A fundamental fact that must be acknowledged is that the Crown owns nothing of value until it is discovered.

However, the fact is that exclusive mineral rights over an area will have some positive value even before any exploration is conducted. That value will reflect people's expectations about possible discoveries and how much it is likely to cost to exploit them relative to expected revenues. Of course, such expectations will be conditioned by the uncertainties and risks surrounding the investments in exploration and (possibly) mining which will be required to generate anticipated mineral rents. In principle, the Crown could auction such mineral rights subject to no further royalty charges on any mine output produced, with the auction proceeds achieving a return for the community which was 'fair' in light of the information available at the time. To date, though, the Crown has preferred to wait until the actual value of the resources is known and to levy royalties on mine production. It is of critical importance to recognise that the conversion of an asset of uncertain and generally low value (an unexplored area) into an asset of high realised value (a profitable mining operation) is, on the relatively infrequent occasions on which it occurs, the product of risky investments in exploration and mine development. The extent of the Crown's 'fair'
claim on the net value of mine output depends importantly on the extent to which it has shared in the risks inherent in creating that additional value. But this is not simply a matter of ‘fairness’. Any system of royalty charges which does not provide for ‘risk sharing’ will, of necessity, increase the risks borne by exploration and mining companies. This will deter them from undertaking investments which would otherwise have been socially worthwhile and will result in an inefficient exploitation of Australia's resource potential.

The people of Australia are entitled to be appropriately compensated in return for transferring the rights to exploit the country's mineral wealth to others. The real issue is whether existing royalty arrangements accomplish this objective or whether they fail not only to secure an appropriate return but, in the process, compromise the efficiency objective (with the result that the Australian community gets the wrong-sized slice of what is, in effect, a diminished mineral pie). It is argued in this section that the latter situation is presently the case, but that this can be remedied to the advantage of both miners and the community as a whole by adopting alternative royalty arrangements which meet the conditions specified above.

Before leaving the topic of the community receiving an appropriate share of the wealth generated by exploiting minerals, it is worth posing the question of what governments should do with the proceeds generated by royalty payments. Since minerals represent non-renewable natural assets, exploiting them is akin to running down physical capital for which depreciation provisions are made lest we think we are getting progressively richer. We should not confuse the depletion of valuable assets with the generation of income, nor adopt the notion that rapid economic growth can be sustained solely by exploiting our natural resource base. Accordingly, governments should use royalties to retire public debt or at least for purposes for which they would otherwise be prepared to borrow (eg to add to the nation's infrastructure). What governments should not use such monies for is to finance government current consumption. One way of differentiating royalties from other government receipts (such as from taxes) would be for State and Territory Governments and the Commonwealth to set up Mineral Resource Capital accounts into which to pay mineral royalties and out of which to pay for equivalent and equally valuable assets so as to secure the sustainability of the wealth created by the exploitation of Australia's natural resources.

*The concept of mineral rent*

A mining company undertakes a project in the expectation of making a profit on the investment involved. In order to justify the geological and economic uncertainty inherent in most such projects, a minimum expected rate of return is required to encourage the company to proceed. Any surplus that the project makes in excess of this minimum required rate of return represents the net value of the project (or economic rent associated with the particular mineral deposit). Thus, economic (or in this case mineral) rent is the difference between the revenue obtained for the minerals and the costs (eg for labour and capital) incurred in earning that revenue - where costs are most appropriately defined as opportunity costs (ie minimum expenditures necessary to attract necessary inputs of labour, capital etc into the particular mining endeavour, rather than have those resources engaged in some other economic activity).

An important point to note here is that an integral component of the costs associated with deriving revenue from mineral deposits is the cost of their discovery (ie attributable exploration expenditures). Thus, the net value of a deposit should be properly defined to take account of relevant exploration outlays. This net value (or mineral rent) is an appropriate basis for charging for rights to develop mineral deposits (see discussion of pure-rent royalties below).
Alternative royalty schemes

Specific rate royalties (levied on the volume of mine output - such as a given dollar amount per tonne of ore shipped from the minesite) and ad valorem royalties (levied as a percentage of the value of output - such as a fixed proportion of the free on rail value of ore shipped from the minesite) are the most commonly used royalty systems in Australia. However, there is now an increasing tendency to levy profit-based royalties (or to incorporate a profit-based component in addition to a specific rate or ad valorem royalty).

The Resource Rent Tax (RRT) applied to offshore petroleum extraction is an extension of profits-based royalties which involves a limited attempt to define taxable profits as those in excess of the normal rate of return required of exploration and mining investments. It is, thus, appropriately characterised as a `rent-based' royalty, although the actual tax base may often diverge substantially from true economic rents.

An alternative to the above are charges on pure rents (in this case properly calculated mineral rents). The auctioning of a mineral right subject to no subsequent royalties is such a charge, since the amount bid at auction will reflect expectations of surpluses (rents) over and above necessary returns to exploration and mining investments. Alternatively, a pure-rent tax may be applied to the conduct of exploration and mining activity. The characteristics of such a tax are described below and compared with other royalty forms.

Efficiency of pure-rent charges

A pure rent tax (sometimes referred to as the Brown Tax) is a tax on project net cash flows in which the government shares to the extent of the tax rate in both positive and negative outcomes. With a 50 per cent tax rate, for example, the government would contribute half the cost of initial investments in the project. Subsequently, it would receive half of the value of any future mineral rents generated by the project or it would cover half the losses. The government thus shares as an implicit equity partner in the fortunes of the project.

Rather than the government paying its share of initial project costs directly, it could incur a liability which would be discharged with interest against its share of future net revenues or, failing that, by some other guaranteed means (eg allowing loss transfers between projects within the same company, allowing loss transfers between companies or, as a final resort, making direct payments to the company concerned if a liability still exists at project termination). The petroleum RRT operates in this way except that the government only guarantees to discharge the `liability' against its share of future net revenues from the project. The company then faces the risk that this `liability' will never be discharged (because the project turns out to be insufficiently profitable). In an attempt to compensate for that risk, the interest rate at which this liability is carried forward (the threshold rate) is set significantly above the interest rate on government bonds. Unfortunately, the risk of government `default' varies widely across different kinds of exploration and mining.
investment, so that a uniform threshold rate will often be too low to compensate for this risk (in which case investments which would otherwise have been worthwhile will be deterred) and will otherwise be too high (in which case the government will obtain a smaller share of revenues than is justified and investments which are not worthwhile will be encouraged). These deficiencies have been recognised, but only partially reduced, in recent amendments to the Commonwealth's RRT legislation for offshore petroleum mining.

The limitation on the government's risk exposure under the petroleum RRT (compared with a pure-rent royalty) ensures that its mineral revenues are substantially reduced: on the one hand because it obtains a smaller share of revenues from the less risky investments which do proceed and, on the other hand, because a number of more risky investments (which would generate positive expected net revenues) are discouraged and do not proceed. However, the petroleum RRT is less defective in this regard than are specific rate, ad valorem, or accounting profits-based royalties, since these royalty systems make no attempt to compensate for the failure of government to share in the investment risks which are necessary in order to generate mineral revenues.

Royalties not based on an appropriate assessment of available mineral rent are effectively a tax on mining investments and have the effect of transforming ore which would have been economically viable into the sub-economic category (see Appendix E of Volume 2). In practice, the extent of induced inefficiencies is an empirical issue which is very difficult to address, but if results from the Commission's highly stylized model of a mining operation (see Appendix E) are at all indicative, the size of the mineral cake may be a good deal smaller as a result of resorting to inefficient royalty schemes than would be the case if efficient royalty schemes were adopted instead (see also ABARE 1990). In other words, the stakes may indeed be very high both from the point of view of mining companies and the community alike as a result of persisting with existing royalty arrangements.

In contrast, cash bids and other types of pure-rent royalties are neutral, because they are a direct reflection of assessed mineral rent. They do not distort mining decisions, since they only appropriate surpluses or profits in excess of the company's required rate of return. In the words of AMIC (sub. 29, p.82):

A tax on economic rent is based on the value of output less all costs, including capital costs. Thus, unlike a tax on profits, it does not fall on returns to capital and it could be designed to ensure that costs of exploration and research and development are taken into account.

A tax on true economic rent does not distort input or output decisions because it has the same effect on the prices of all inputs and outputs. The net price received for an additional unit of output is reduced by the tax rate, while the price of inputs is reduced by the same proportion. Profits are lowered compared to the case where there are no state mineral taxes, but there is no incentive to change the level or mix of inputs and outputs.

**Rent-based royalties are more efficient than output- and profit-based ones.**

Several participants strongly disputed that rent-based royalties were necessarily efficient. For example, WMC (sub. 239, p.9) contended that:
... the fundamental defect of a resource rent royalty is that it taxes efficiency and thus operates as a disincentive to the miner to increase productivity.

As noted above, this objection applies to the petroleum RRT but it does not apply to pure-rent royalties. In the latter case, the share of any mineral rent taken by the Crown is simply equal to the share which it contributes to all expenditures, including those which contribute to increased productivity. Unless the proportionate royalty rate is set at a very high level (ie approaches unity), so that the private share in the project is very small, it will always be in a company's interest to improve efficiency.

Of course, mineral rents associated with individual projects will often be negative (as, for example, when exploration fails to discover a viable mineral deposit). In those cases, the application of a pure-rent royalty will, by one route or another, involve the Crown in making net payments rather than receiving net revenues. This highlights the risky nature of pure-rent royalties, which are commensurate with the risky nature of the investments necessary in the ownership by the Crown of mineral assets of uncertain value. Those risks cannot be eliminated by adopting royalty regimes which insulate the Crown from any risk bearing; they can only be shifted onto private investors in ways which will reduce the efficiency with which resources owned by Australians are exploited and, overall, the size of the revenues that the community can expect to gain from those resources.

If the community (as represented by the Crown) is less willing than the private sector to bear risks associated with the exploitation of mineral rights, it can reduce its risk exposure by selling some part of its claim on such assets. At the extreme, the Crown could auction mineral rights subject to no future royalty charges, so that its subsequent claim and level of risk exposure were reduced to zero. More generally, it could auction mineral rights subject to the application of a pre-defined rate of royalty (to apply \textit{ex post}). The rate of royalty would define the extent of the Crown's risk exposure, and the value of the auction proceeds would reflect the share of rents which were expected to be earned by the purchaser of the mineral rights. The lower the rate of (\textit{ex post}) royalty, the larger will be the share of any rents earned which accrues to the private investor and, therefore, the higher the auction price they will be prepared to pay for mineral rights.

\textbf{Implementing a pure-rent royalty}

In Chapter 3 it was concluded that the efficient mechanism for allocating mineral rights is by a system of cash bidding. Combining cash bidding and a pure-rent royalty to apply \textit{ex post} provides the community with the opportunity to balance its desire to obtain the maximum revenues from the exploitation of its resources against its limited willingness to accept risk.

Risk-averse governments would choose to rely wholly on the proceeds of up-front auctions by setting the rate of \textit{ex post} pure-rent royalty at zero. But the amount collected could be considered by some to be unacceptably low, especially if a world-class mineral deposit was subsequently found on land which originally attracted only a `modest' bid. However, acting with the benefit of 20-20 hindsight is not what it is all about, unless governments are prepared to accept the consequences of mining companies being forced to operate in an environment characterised by high levels of sovereign risk (see below and discussion elsewhere in this report of this significant
impediment to the efficient development on mining in this country). To share in the occasional ’bonanzas' with the potential to generate very large amounts of mineral rent, government must also share in the very considerable risks which are endemic to the industry. In the case of unsuccessful exploration, this will involve government sharing the costs of outlays which generate no returns at all (either by writing a cheque for their share of such expenditures, allowing an equivalent deduction against liabilities for taxes, or allowing the right to claim such deductions to be sold to others).

If government is prepared to accept some level of risk, it should opt to auction what would represent conditional mineral rights to a particular area, with the condition being a requirement that pre-announced pure-rent royalties will apply \textit{ex post} to any mineral deposit which is subsequently found and exploited (an option referred to in Chapter 3). In these circumstances, those interested in acquiring (and exercising) those rights will discount their up-front bids to take account of possible future royalty liabilities (if bids are non-deductible - see Box 14.4 of Section 14 (Royalties) of Volume 3), or bid the full value to them of the mineral rights up front (if bids are made deductible in order to 'equalise' the bids of prospective miners with those intent on acquiring mineral rights with the sole purpose of not exercising them - see Box 14.5 in Volume 3); while government will obtain some money up front, with the prospect of supplementing this element of the charge for transferring mineral rights if a valuable deposit is subsequently found, but also with the possibility that it may have to pay out in the case of projects which terminate in the red.

An implementation issue alluded to above is how to ensure 'comparability' of bids when non-mining interests are free to bid at auction. This is because, unless some adjustment is made, miners must temper their bids by taking into account possible future liabilities to pay royalties, whereas landowners and conservation groups not intending to exercise the mineral rights on offer would not have to adjust their bids to take account of this likelihood. This means that intending miners could not afford to bid the full value of mineral rights up front.

One way to make the bids of those intending to exercise mineral rights comparable with those wishing to acquire those rights with the intent that they not be exercised is to allow bids to be deductible as a legitimate business expense before assessing liability for royalty payments. The effect of this (see Box 14.5) is that miners will now bid up to the full expected value of mineral rights to them. Comparability could also be achieved by not allowing deductibility but 'adjusting' intending miners' bids for the expected value of royalty liabilities, and using those 'adjusted' bids to determine the winner of the auction, while requiring an intending miner (if the successful bidder) to pay only what he/she actually bid.

To ensure that royalties collected \textit{ex post} are actually levied on pure rents, mineral rent must be calculated properly. Allowing exploration expenditures to be deductible in respect of each project (whether or not a viable mineral deposit is discovered as a result) is crucial to the neutrality of rent-based royalty systems. This means that government has to 'pay' for its share of losses in cases of unsuccessful exploration, either explicitly or implicitly in the form of tax expenditures whereby, as alluded to above, governments allow all attributable exploration expenditures to be deducted against revenues from the exploitation of mineral deposits which are discovered, or allow such losses to be 'sold' to another company in a position to benefit from such a deduction. With each
State/Territory potentially running its own scheme, one limitation on trading in losses may have to be that trades take place within the one jurisdiction, rather than across such boundaries (unless an intergovernmental agreement allows such trades, for example on grounds that it will all even out over the long run).

An alternative to allowing all attributable costs to be deductible when calculating the basis for levying a rent tax (as has been adopted by the Commonwealth Government in respect of petroleum) is to only permit limited deductions, but to compensate for this by allowing companies to earn a 'risk-adjusted' rate of return on their investment before the tax bites. The Commission does not advocate such royalty schemes in the case of minerals, because they are not neutral (and are therefore inefficient) if for no other reason that an inevitable element of subjectivity is introduced by having to choose the parameters of the tax (eg how much to allow for the risk premium). The Commission prefers instead pure-rent schemes of the type(s) outlined above and considered in detail in Section 14 of Volume 3.

Sovereign risk revisited

Investment and operational decisions will be distorted if royalty arrangements implemented by governments heighten industry fears of 'sovereign risk' (ie governments imposing additional - and unanticipated - imposts), or add to uncertainty (which is already an inherent feature of mining), without a commensurate prospect of increased financial returns.

In practice all royalty systems may suffer from 'sovereign risk' which adds unnecessarily to uncertainty in the industry.

The direct effect of sovereign risk on mining decisions is very difficult to quantify (but see treatment in Appendix E of Volume 2). However, an indirect effect may be observable in the case of existing royalty arrangements. Governments sometimes increase royalties (or impose de facto royalties - such as excess rail charges) when it is believed that current output-based royalties collect very little mineral rent for the community (and, conversely, sometimes reduce royalties during bad times). For example, the specific rate royalty applying to the Saxonvale open-cut coal mine was increased from $1.00 to $1.70 per tonne in 1981, decreased to $1.36 in 1978, and increased again to $1.70 per tonne in 1989 (see Section 14 of Volume 3). Such responses to the 'capacity to pay' problem can be costly and add significantly to uncertainty. A more efficient response would be to establish a royalty system which governments are less likely to be tempted to alter as circumstances change.

A potential advantage, therefore, of pure-rent royalties is that they automatically adjust to capacity to pay. Some participants, however, considered that rent-based royalties may add to sovereign risk. CRA, for example, suggested that for a number of its mines:

... because of the high capital expenditure involved and because of the need for continued injections of capital during the mine's life, it would be many years, in some cases decades, before royalties were payable. This would be despite the fact that at a much earlier period mines could be making significant accounting profits. ... [Sovereign] risk is massively increased when a community and a government see an operation making significant profits yet paying no royalties.
If this is considered an insuperable problem, a compromise would be to combine an *ex post* pure-rent royalty with small specific or ad valorem royalty so that politicians can point to the latter component as proof that a particular mine is ‘paying its way’. The other alternative, advocated above, would be to have a component of mineral rent paid up front in the form of a cash bid, which should be equally capable of being pointed to. Also, this phenomenon may be less of a problem if politicians can point to an inexorably increasingly bottom line on the balance sheet of the State/Territory's Mineral Resource Capital account (see previous discussion).

**How do royalty schemes compare on other criteria?**

*Administrative and compliance costs need to be considered*

Specific royalties are the easiest to administer because only mine production statistics need verification. Ad valorem royalty calculations are more complicated, as they involve valuing minerals (and may require auditing if transport costs are deducted from sales revenue in order to levy the royalty on an ex-mine basis). Profit-based and rent-based methods require more extensive measurement and auditing procedures, since a variety of costs is properly deductible against revenue (although the former have to be calculated for income tax purposes anyway).

In addition to direct administrative costs, there are compliance costs for companies and the administrative and lobbying costs of hardship reviews (especially in the case of output-based royalties). In particular, compliance costs for rent-based schemes may not be substantial, since the required information should be readily available from company accounts.

Superficially, cash bidding involves least administration costs because of the one-off nature of the collection process. However, there would be some preparatory effort by government and industry. Thus there is a need to consider the efficiency of the entire allocation and charging for mineral rights (including administrative and compliance costs).

*Effects of the timing and pattern of royalty payments may also concern governments*

For an individual project, specific and ad valorem royalties provide a more stable flow of royalty revenue for government compared with rent-based royalties, because the royalty base will fluctuate less. But government revenue stability from specific and ad valorem schemes can only be bought at the expense of inducing increased instability in mining company net returns.

However, for government budgetary purposes the primary concern should be the aggregate level of collections. With this focus, it is unlikely that royalties from rent-based systems would be significantly less stable (or predictable) than revenue from output-based royalties compared to other sources of State revenue. Further, for most States the effect of substantial variations in the aggregate level of royalty revenue will be muted, because of the typically low share of total State receipts accounted for by such payments. In any event, as pointed out previously, revenues derived
from mineral royalties should be treated as proceeds akin to those flowing from the sale of other publicly owned assets, and therefore paid into some sort of Mineral Resource Capital accounts (ie treated as capital rather than current budget items).

**How can current royalty arrangements be improved?**

Even though current output-based royalties are levied at what appear to be modest rates, they have at times exceeded the capacity to pay for certain projects, and must have deterred marginal production. Alternatively, for projects during boom times (and some highly profitable mines) output-based royalties must have collected very little of available mineral rents. These contrasting situations have resulted in a number of costly responses, namely, a smaller mining sector than would otherwise have been the case, administrative costs of hardship reviews, and the imposition of additional royalties (such as the coal export duty) and *de facto* royalties (such as excess rail freight charges).

In recent times, some governments have introduced royalty arrangements (eg profit-based royalties) which vary more closely with a project's capacity to pay. These profit-based schemes reduce the problems associated with output- or revenue-based royalties but, because they are not levied on economic rent, they still lead to efficiency losses by deterring investments which would otherwise have been worthwhile.

The Commission recommends that recent moves to adopt royalty systems which incorporated a profit-based element be taken to their logical conclusion of charging pure-rent based royalties, to apply to metallic minerals and coal.

The Commission's recommendation does not apply to low unit value commodities (such as limestone and construction materials). For such commodities, rents (if they exist at all) are likely to be insignificant and increased administration costs compared with existing arrangements would likely outweigh any efficiency gains from changing royalty arrangements.

The form of pure-rent based charging mechanism could be either an *ex post* pure-rent royalty, an *ex ante* payment in the form of the winning bid at a competitive auction of mineral rights or (more likely, perhaps) some combination of the two. The advantage of a more neutral, rent-based system of charges for the right to exploit mineral resources is that it allows companies to make decisions which are consistent with the maximisation of the value of those resources (see Appendix E in Volume 2). As noted in Chapter 3, however, exclusive reliance on cash bidding as the sole means of charging for mineral rights would be seen by many to involve a significant sovereign risk problem.

The application of a pre-announced conditional royalties based on the net value (or economic rent) associated with a deposit would reduce reliance on cash bidding as a charging mechanism for allocating mineral rights of the type advocated by the Commission.

The Commission recognises that the recommended changes in procedures for determining royalty payments and/or allocating leases are quite radical and could be perceived to create significant short-term administrative and budgetary strains for the relevant governments, as well as for mining companies.
However, the Commission does not believe that the cash flow calculations required to administer a pure-rent based royalty system impose as large an information requirement as, for example, does the administration of the profit-based royalties which are in general use in the Northern Territory. Equally, the removal of many of the conditions presently attaching to exploration and mineral leases, and the provision of more secure tenure, would reduce administrative burdens at both the government and company level.

The further governments move towards a pure rent-based royalty system, the less stable and predictable their net revenues may become. The NSW Government (sub. 217, p.13), citing revenue under the existing output-based royalty system of $117 million in 1989-90 in the context of a $344 million Budget deficit, submitted that "because of the significance of the stability issue to NSW Government budgeting at the margin, NSW is only prepared to consider a resource rent royalty scheme for new projects or significant extensions of existing projects". The Tasmanian Department of Resources and Energy (sub. 242, p.8) expressed concern that "if the State were to rely on a rent-based approach there would be a considerable loss of royalty revenues".

While the Commission does not accept that this should be a particular source of concern for governments because they can (or ought to be able to) offset variations through other financial transactions, it recognises that some form of transitional arrangement may be called for. For example, to the extent that State governments remain concerned about the short-term revenue effects of an immediate change to rent-based royalties, the system could be structured along the lines of the Argyle Diamond or Roxby Downs royalty arrangements (which levy the maximum of an ad valorem or profit-based royalty). Similarly, the Commission notes that the Tasmanian Government modified the royalty system in July 1990 to introduce a modest ad valorem component in addition to its profit-based royalty.

However, where such arrangements are adopted, the Commission suggests that the ad valorem rate be kept as low as possible because of adverse efficiency effects - certainly lower than the rates commonly applying at present. The Commission anticipates that the need to apply these inefficient forms of royalty would fade away as governments and companies became accustomed to the application of rent-based royalty arrangements.

Although application of the Commission's recommendations to 'greenfields' sites would be relatively straightforward, the assessment of existing leases and projects for a rent-based royalty involves more difficult problems and judgments. In recognition of the problems caused by sovereign risk, the Commission considers that adoption of rent-based royalties should not be a unilateral decision of government.

The Commission recommends that if a pure-rent royalty regime is adopted, existing projects should, within a short period of its coming into force, have a once-only option of changing to it. Further, projects which change over to rent-based royalties need to be given credit for capital investment not yet recouped. This could be done by allowing a deduction equal to the written down value of capital (eg as taken from taxation records) in the first period of calculation of cash flow.
Making the changeover to a rent-based royalty regime optional for existing projects should also allay many of the fears by State governments about the effects on their revenue base and stability.

6.6 Taxation of mining and the efficient use of resources

Does the introduction of taxation on goldmining penalise producers?

The Commonwealth Government's intention to tax income from gold mining (hitherto exempt from such a tax) was announced in the 1988 May Economic Statement and the repeal of existing exemption provisions was made by the Taxation Laws Amendment Act 1988. The taxation of gold income from January 1991 is thus a fait accompli, and, moreover, fully justified on economic efficiency and horizontal equity (ie the equal treatment of similar activities for tax purposes) grounds. Thus, while WMC's observation (sub. 239, p.12) that "the exemption of gold from income tax has been a significant factor behind the enormous growth in this sector of the mining industry during the past ten years" is undoubtedly true, this is hardly surprising given the tremendous advantage tax exemption gives this sector relative to other economic activities. The repeal of the exemption is thus merely correcting an existing distortion within the tax system.

While the justification for equality of tax treatment between goldmining and most other activities was generally accepted in submissions to this inquiry, some participants expressed concerns with the transitional arrangements to apply in the period between the announcement date and active date of the Act. The transitional arrangements allow for notional deductions for certain capital expenditure incurred by gold miners prior to 1 January 1991 in order to determine actual deductions for such expenditure after that date; and for exploration or prospecting expenditure incurred after 25 May 1988 and before 1 January 1991 to be carried forward for deduction after that date, subject to a seven year limit. A principal concern was that the arrangements do not provide for the same matching of expenses against income as for similar activities, particularly other mining operations.

Fringe Benefit Tax should be applied at the full rate

Fringe Benefit Tax (FBT) is payable by an employer on non-PAYE (ie non-wage) benefits provided to employees. For the mining industry most of the tax is payable for housing provided in remote areas at below cost. CRA stated (sub. 73, p.51) that this totalled about $15 million in 1988-89 (covering more than 22,000 dwellings).

Although all industries with activities in remote sites (including the mining industry) receive a 50 per cent concession on FBT for remote area housing, the industry argued that no tax should apply in these cases, on a number of grounds including:

- adverse social effects if the mining companies did not provide low cost housing in remote areas;
that higher compensatory wages may not even be an option because of rigidities in the wage system;

• that the FBT is encouraging new developments to use `fly-in-fly-out' arrangements, thereby adversely affecting long-term development; and

• on equity grounds by noting that some services in populated areas such as transport and energy are subsidised because the government does not fully charge for usage.

The Commission acknowledges that a change to cash-only packages which equalise existing after-tax remuneration could adversely affect mining companies because it may lead to higher labour turnover rates and will involve disproportionately higher wages increases because of the progressive nature of income taxation. But this has always been the case - FBT or no FBT. In fact, most companies continue to provide some housing fringe benefits despite FBT liability, obviously because their judgment is that this is better than the cash-only alternative. In this sense, the application of FBT is merely closing a loophole.

Similarly, the Commission agrees that the FBT has increased the cost of remote area housing. While some new developments have opted for fly-in-fly-out, existing projects with local townships have had to pay the additional cost of the tax.

However, neither of these arguments justify preferential treatment of the mining (or indeed other remote-area) industry for FBT liability. Employers in many other activities are beset with similar problems since FBT was introduced. What may differ is the severity of the impact on mining. But again this does not justify lower FBT liability for mining.

The Commission recommends that full liability for Fringe Benefits Tax apply to benefits provided by mining companies (and other employers in remote areas).

If the intent of the current FBT concession is primarily to satisfy decentralisation goals and encourage labour to remote regions there are better targeted and more transparent methods of achieving this: for example, generally available decentralisation grants and through the personal income tax system (eg via zone rebates).

Local government rates can effectively tax mining

Local government rates based on the value of mine outputs are a poorly disguised resource tax. This acts to discriminate against mining when other taxpayers are rated on the unimproved (or rental) value of their land holdings. Tempting as it no doubt is for local government to raise revenues from local mining operations on assessed ability to pay, the real problem which should be addressed is the necessity to sort out their finances with other levels of government in Australia, rather than attempting to make up for shortfalls by resorting to discriminatory taxes.
The Commission recommends against local government rates being levied on the value of mine outputs, but notes that this may necessitate reform of local government financial arrangements involving other levels of government.

**Tariffs tax efficient industries**

The Commission's strong views on tariffs and the costs such protective measures impose on other economic activities (particularly mining - see Appendix F of Volume 2) should not need to be reiterated here. The Commission strongly supports current Commonwealth Government initiatives to lower tariff barriers and urges the Government to continue its program of progressive reductions beyond 1992 when current targets will be reached.

**Indirect taxes are not being addressed in this inquiry**

Many participants raised the issue of the effect of various indirect taxes (including tariffs) on the competitiveness of mining projects. Thus, complaints were registered against the diesel and fuel oil excise, State payroll tax, sales tax on inputs, and tariffs on imports. While the Commission acknowledges the deleterious effects such taxes can have on the competitiveness of activities under reference in this inquiry (see, for example, IAC 1986), it also recognises that this issue is relevant to economic activities across the whole economy. In view of the ramifications for other economic activities of making any recommendations in this area, which have not been able to be addressed in the context of this inquiry, the Commission does not propose to make any recommendations in the area of indirect taxes on this occasion.

A more detailed discussion on the present income tax provisions applying to mining is at Section 13 of Volume 3.

**6.7 Regulation has the usual `dead hand of government' effect on mining**

Another form of government intervention which has a direct and important effect on the economics of mineral extraction is government regulation which determines the way in which mining operations are to be carried out.

Many of the problems are the same as those applying to government regulation at the mine approval stage (see Chapter 4). These include duplication among government agencies, ill-defined requirements subject to ministerial or bureaucratic discretion, and the general problem of over-regulation. These problems seem particularly acute in regard to ongoing environmental monitoring and regulation.

Some additional problems, however, affect the efficiency of the extraction stage of mining. Most stem from provisions in the various State/Territory Mining Acts. Specific provisions common to much of the State mining legislation which may lead to inefficient patterns and rates of extraction include:

- lease conditions which impose work or program commitments on developers and which may force companies to work at a rate or manner not justified by the state of mineral markets or consistent with the most efficient exploitation of a particular mineral deposit;
• ministerial control over dealing in leases which may hinder the lease being transferred to the most efficient developer;

• time limits on leases which may encourage miners to extract minerals as quickly as possible, rather than to adopt a pattern of extraction which maximises the value of the deposit over time.

State/Territory Mining Acts often rely on outmoded concepts not conducive to modern mining methods (eg size of leases), allow for an unwarranted degree of administrative or ministerial discretion to be exercised, and are sometimes inconsistent when there is no good reason for different approaches to be adopted. Many provisions in these Acts also unnecessarily restrict the decision-making powers and flexibility of companies to adapt to changing conditions, thereby inducing inefficient behaviour in the industry.

The Commission recommends that State/Territory Governments review their Mining Acts to take account of advances in technology, to limit the scope for ministerial or bureaucratic discretion, and to modify those provisions which currently induce inefficiency (eg expenditure conditions). Consideration should also be given to some form of co-ordinated review to promote consistency between States/Territories where this would be in the interests of the nation as a whole.

A more detailed analysis and description of the effects of various aspects of State legislation applying to the mining and minerals processing industry is at Section 12 of Volume 3.

Is the coal industry over-regulated?

The coal industry has been and still is perceived by many to be `special' for various reasons, including the dangerous nature of the work, its relatively long history compared with other industry in this country, the fact that it has been a particular focus of struggle between management and labour, because of special safety concerns (eg gases not present in other mines), and because coal mining often occurs in close proximity to (or under) urban areas - a somewhat chicken and egg situation. For these and other reasons, governments have intervened in the coal industry more than most - with the result that supervision and regulation of coal mining projects is largely unparalleled in terms of other Australian industries. Section 22 of Volume 3 examines in detail the range of interventions affecting the coal industry and their effects, while Volume 4, `Regulation of the coal industry: a case of over-regulation' provides examples of the level of government regulation of the industry.

The Joint Coal Board (JCB) - a joint Commonwealth/NSW Government initiative - was established at a time when the industry was in a chaotic state, with relations between proprietors and mineworkers characterised by bitterness and the industry unable to satisfy the country's coal requirements. The JCB monitors and regulates many (even day-to-day) operations of the coal industry, including production decisions (including whether or not mines can open or even cease operations), workers compensation arrangements, aspects of industrial relations, marketing and occupational health and safety. Many of the Board's powers and functions were seen by participants to be unjustified, costly and duplicative. The Commission agrees with that assessment. The JCB is currently being reviewed by a joint Commonwealth/NSW Government inquiry.
The Queensland Coal Board (QCB) was set up under similar circumstances to those of the JCB. While it has traditionally taken a far lower profile than its NSW counterpart, it does have extensive powers over the mining and sale of coal in Queensland. The Queensland Government has recently announced its intention to expand the functions and resources of the QCB, making it "responsible for providing long-range planning and policy advice as well as ensuring that government policy on the industry is implemented" (Minister Ken Vaughan 1990). In the Commission's view, this expanded role is unlikely to benefit the industry or the nation.

Industrial relations in the NSW coal mining industry are handled by the Coal Industry Tribunal and subsidiary Local Coal Authorities. The (NSW and Commonwealth) Coal Industry Acts give the Coal Industry Tribunal (CIT) the power to consider and determine industrial disputes, industrial matters arising under an award or order of the Tribunal relating to the coal industry in NSW, and any matter affecting interstate industrial relations in the industry. (By virtue of the Commonwealth Act, the CIT's jurisdiction extends to the coal mining industry in Queensland and Tasmania, although Local Coal Authorities are restricted to NSW.) Submissions that commented on the coal industry's institutional arrangements generally proposed that the CIT be subsumed in the Australian Industrial Relations Commission. The NSW Government indicated (sub. 217, p.15) that it supported this recommendation and would co-operate with the Commonwealth Government in facilitating such an initiative. Another coal industry tribunal also exists in Western Australia.

The Coal Mines Regulation Act 1982 (NSW) represents, in essence, a comprehensive code of conduct designed to maintain the safety and health standards of people employed in NSW open-cut and underground mines. The NSW Coal Association (NSWCA) was critical of this Act. According to the NSWCA, the Act is inconsistent with modern management practices and does not provide a positive framework within which employers can ensure the highest standards of health and safety for their employees (sub. 45, p.12). Furthermore, the Association considered that the very prescriptive regulations accompanying the Act diverts attention away from health and safety goals and make compliance an end in itself (p.12). Oakbridge submitted (sub. 32, p.27) that regulation of coal mines is appropriate, yet it believed the NSW Act and its regulations were unnecessarily prescriptive in specifying the technical operations of coal mines and imposing a particular management structure. The NSWCA also indicated that "notification, approval and appeal procedures are unwieldy, detailed and far too lengthy"(p.13). The NSW Government is currently reviewing the Coal Mines Regulation Act (and other mining legislation).

In 1978, the Commonwealth Government legislated to levy 5 cents per tonne on saleable coal to boost Australia's energy research effort. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) submitted (sub. 61, p.22) that there was a considerable number of Australian coal and mineral firms which were unable or unwilling to provide a high or even a medium research and development capacity continuously, and hence supported the coal research and development levy. In contrast, the Australian Coal Association (ACA, sub. 71, p.29) opposed the
levy. ACA submitted that the growth of the coal industry has meant that a number of companies now pay more than $1 million into Coal Research Trust Account each year and are consequently "less prepared to accept decisions by third parties on how sums of this magnitude are used." ACA added that various research programs were not adhering to strict cost-benefit criteria (see Section 22 of Volume 3 for more detail). Enabling legislation has recently been introduced by the Commonwealth Government to create a Coal Research and Development Corporation.

**Changed conditions have in many cases weakened or totally negated the original rationales justifying government intervention in the coal industry. In the face of changed circumstances and the now highly competitive nature of international coal markets, retention of inappropriate regulations is impeding the efficiency and economic performance of the industry.**

The Commission is convinced substantial gains would flow from reducing the level of intervention in an industry that is currently Australia's largest earner of foreign exchange.

**In the Commission's view, there is no justification for continuing to have any separate regulatory body overseeing the coal industry. The Commission recommends that the Joint Coal Board and the Queensland Coal Board be disbanded and any necessary ongoing functions allocated to other existing bodies.**

The Commission also considers that there is no case for any separate industrial relations tribunal devoted to the industry. The Commission recommends that the NSW and WA Coal Industry Tribunals be disbanded and their functions be subsumed by the Industrial Relations Commission (or appropriate State body).

Since the coal industry is prepared to meet its own research and development needs and can capture the resultant benefits, the Commission considers there is no justification for further government intervention in the form of a research and development levy. If this levy is retained, however, research programs should be responsive to industry needs and should adhere to strict cost-benefit criteria.

**6.8 Mining and its potential to adversely affect the environment is causing increased concern**

Mining and onsite processing of mine outputs raise many environmental concerns. For example, the sorts of images conjured up in many people's minds when they think of these activities are of huge unsightly holes in the ground, storms of dust obscuring the landscape for miles around, an incessant cacophony of heavy machinery, roads choked with heavy trucks hauling endless loads of mine outputs, powerful and dangerous chemicals being used to treat ores, waterways rendered sterile by heavy metals and other contaminants, landfills and tailings dams filled with intractable wastes and, finally, abandoned mineshafts which pose an ongoing hazard to the unsuspecting.

But in many ways these are (or should be) images of the past, when rape and pillage of the earth by miners was the rule, rather than the exception. Today's miners know that the community expects (and will if necessary demand) careful management of all aspects and stages of mining and onsite
processing to contain the environmental consequences of their activities within acceptable limits. Holes will have to be filled in (or otherwise be left in an acceptable state), dust will have to be controlled, noise abatement procedures will have to be practiced (especially in the case of mines located near populated areas), dangerous substances will have to be handled with care and disposed of in an acceptable manner (and not allowed to poison waterways) and environmental protection authorities will have to be convinced about the stability and long-term safety of landfills and tailings impoundments. Nowadays, the community expects that once mining is complete and modern rehabilitation techniques have been applied to stabilise former minesites, the surface will in many cases be returned to (and in many cases represent an improvement on ) its former productive state.

One reason why miners really have no choice but to be (or become) good corporate citizens when it comes to looking after the environment is the increasing trend towards what has been coined NIMBYism (not in my backyard syndrome). "No force will more powerfully drive the greening of world industry than the hostility of people, as they grow richer, to those installations that they see as polluting. Mention the possibility that the pollution may be carcinogenic, and the backyard gates slam shut for good" (The Economist 1990). Increasingly, companies that want to make potentially polluting investments invest large amounts of management time in building links with local people.

A major environmental concern associated with the extraction process is the disturbance to land surface that this often involves. This raises questions to do with rehabilitation of land after mining. Other environmental concerns are raised by the beneficiation or early on-site treatment of the minerals extracted.

Can land used for mining be successfully rehabilitated?

For the purposes of this report, a distinction is made between restoration and rehabilitation - with the former referring to the act of attempting to return disturbed land to its original state; while the latter refers to the more modest goal of returning land to a state which is compatible with the surrounding area or to a state where it can be used for some useful purpose (such as for forestry or grazing).

Rehabilitation requires financial and other resources which could be devoted to other purposes, so that undertaking it has a social cost in terms of other opportunities forgone. Indeed it was suggested during the course of the inquiry that, given the choice, local communities affected by mining may well decide to spend some of the money otherwise earmarked by mining companies for rehabilitation on projects considered to be of greater benefit. On the other hand, there are clear benefits from rehabilitating land which has been mined, for example removal of what would otherwise become unsightly features of the landscape and recovered fertility and productivity of the affected land surface.

The need to undertake rehabilitation either progressively or at the end of mining is acknowledged by, among others, AMIC and the Association of Mining and Exploration Companies. The latter stated (sub. 15, p.20) that "the mining industry accepts the rehabilitation requirement and includes it as an integral part of the initial mine planning process."
As with other environmental problems, views regarding the success of rehabilitation programs are often contradictory (and can turn on whether the proper objective is restoration or rehabilitation as distinguished above). On the one hand, The Environment Centre of the NT argued (sub. 56, p.3) that:

Rehabilitation has achieved only limited success rates in returning the original flora and fauna. Efforts to rehabilitate a minesite will not restore an area to its former diversity and richness. At best, rehabilitation will stabilise and minimise water and wind erosion.

A different view was put by Coal & Allied Operations Pty Ltd which argued (sub. 79, p.6) that "ten years of rehabilitation experience has demonstrated that a stable reformed land surface which is compatible with the existing landscape character of adjacent undisturbed land can be achieved." The (NSW) Chamber of Mines, Metals and Extractive Industries provided evidence (sub. 124) of three cases - Bridge Hill Ridge (NSW), Crowdy Bay National Park and the Pilbara iron ore industry - where rehabilitation attempts are claimed to have met with success.

A good example of the conflicting views put to this inquiry on the success of rehabilitation programs was in respect of the Jarrah forest in Western Australia. The Australian Conservation Foundation claimed (Transcript, p.551-2) that the ecological impacts resulting from bauxite mining in the area have been "very, very extensive". Yet Alcoa of Australia Ltd has recently been included on the United Nations Environment Programme's Global 500 Roll of Honour for Environment Achievement for its work in rehabilitating the area (see Volume 4, `Mining and the environment', Item 11).

Perhaps the major obstacle to determining the success of rehabilitation is defining 'successful'. If this requires restoring a site to exactly the state prevailing before mining, all rehabilitation would fail. As acknowledged by G.S. McDonald (President of AMIC, Transcript, p.39), "[the mining industry] can never restore [a site] to pristine condition. ... We can mine and restore it to an acceptable and probably equivalent condition and in many cases probably a better condition that it was originally."

As is the case with other environmental issues, the particular form that rehabilitation should take is a site-specific problem. Rehabilitation to a condition similar to the original environment is but one of a number of alternatives. In the case of land of little or no economic value (such as desert/very low rainfall areas) it may not make sense to attempt much in the way of rehabilitation at all - since nature can probably be relied upon to do a better job herself. Some participants (eg CSIRO, sub. 61, p.20) suggested that mining can actually increase land-use options by providing infrastructure that then allows other developments to take place on completion of a mining project. CRA (sub. 73, p.113-4) cited the rehabilitation by Comalco at Weipa as a model for post-mining land-use possibilities. It claimed that since mine rehabilitation began in 1967, 113 trials have been undertaken comprising 41 forestry trials, 17 crop trials, 13 pasture trials, and 42 native flora trials. CRA stated that although no one regeneration venture currently stands out as being commercially

2 For example, human efforts to assist in rehabilitation in the aftermath of the Mt St Helens eruption have, according to a report in the New Scientist (1990), proved counterproductive – “When it comes to repairing a massively disturbed ecosystem, nature knows best.” Many scientists monitoring the recovery now believe that most of the human efforts to speed up the process have failed, and may even have done more harm than good.
viable, cashew nuts, neem trees and pastures show some viability. Other examples cited of post-mining land uses cited included use of open-cut mines as sites for solid waste disposal (NSW Government sub. 52, p.39), and rehabilitation of mine areas to suit community needs such as playing fields or golf courses (NSW Chamber of Mines sub. 37, p.3).

The Commission considers there is no reason why modern rehabilitation techniques should not prove to be generally successful, if success is understood to be reasonable compatibility with the surrounding area. Further, it may make more sense (in terms of the costs and benefits involved) to aim for compatibility with a range of other uses for post-mining land (such as for ongoing agricultural or commercial development), or to undertake only minimal rehabilitation (eg in areas of marginal conservation value).

A more detailed discussion on rehabilitation of land after mining is at Section 7 of Volume 3.

**Are there sufficient incentives for rehabilitation?**

Ensuring that appropriate rehabilitation of mined land actually takes place can be a serious problem when incentives to do so are lacking. How can governments ensure that an appropriate action is taken by mining companies?

*Tax deductibility of rehabilitation expenditure is a problem*

The Commonwealth Government announced in the 1990-91 budget that minesite rehabilitation expenditures (including plant demolition costs) would be deductible in full in the year in which such outlays occurred. However, it is likely that for some companies there would be insufficient income against which to claim such deductions - especially if mining has ceased. In such cases, this means that there may be little incentive to rehabilitate minesites.

The Commission supports recent moves to allow minesite rehabilitation expenses to be tax deductible (but questions whether recent changes have gone far enough).

In the Commission's view, deductibility should be extended to rehabilitation expenditures incurred after mining has ceased. This would raise the practical issue of how to permit deductibility. As proposed by AMIC (sub. 29, p.91), two treatments may be considered:

- carry-back could be permitted; and/or
- a portion of the estimated total cost of minesite rehabilitation could be deductible against assessed income of a mining operation in each year in which the mining operations are conducted.

Annual provisions are used for some contingent liabilities (for example long service leave expenses) and auditing procedures check that they are reasonably based. However, lack of sufficient experience with rehabilitation expenses and the difficulty in accurately anticipating their likely magnitude may introduce a great deal of discretion into the tax system by going down this
route. This could be reduced by establishing a formula (similar to that used for motor vehicle expenditure), or by allowing an annual deduction of a certain amount per lease hectare divided by the estimated mine life - with adjustments made at the end when actual costs are known. However, the cost of rehabilitation varies markedly between different locations and types of mining operation, and rehabilitation techniques and their cost can change relatively quickly - so that end-of-period adjustments could be considerable.

Thus, the uncertainty of rehabilitation costs suggests that tax deductibility of such expenditures should be based on an *ex post* method such as carry-back rather than an *ex ante* method such as an annual provision against future liability.

The Commission recommends that carry-back of minesite rehabilitation expenditures (including plant demolition costs) be permitted for an adequate period.

In the case of plant demolition expenses at mine closure, allowing deductibility would correct the inconsistency of allowing site-preparation expenses to be deductible under Division 10 of the *Income Tax Assessment Act 1936*.

For a more detailed discussion on the tax deductibility of rehabilitation expenditure see Section 13 of Volume 3.

*Rehabilitation bonds should be required*

Most rehabilitation costs need to be incurred as the mine winds down or after mining ceases. Under these circumstances, miners may find it difficult to finance rehabilitation if funds have not been put aside beforehand. A requirement to post a security bond large enough to cover the expected cost of rehabilitation would help to ensure that there are sufficient funds for rehabilitation to be carried out. Indeed, requirements for rehabilitation bonds are already standard features of exploration and mining titles in many States. For example, the NSW Government (sub. 217, p.16) noted that security bonds already required in NSW enabled the industry to choose the most appropriate mechanism (eg cash, bank guarantee) and bonds varied to reflect the varying standards of rehabilitation required (eg the substantial amount of $6.1 million required of the Howick coal mine in the Hunter Valley).

The Commission recommends that mining companies be required to post rehabilitation bonds (or equivalent financial instruments) sufficient to cover the estimated costs of appropriate rehabilitation of the mine site. Further, governments could consider requiring the posting of `performance' bonds (or equivalent financial instruments) in cases where it was judged that there is a demonstrable potential that a mining project could cause `catastrophic' environmental damage, with such bonds being automatically forfeited should such damage occur.

Some mining companies objected to the idea of having to post bonds, often on grounds that it would represent an unnecessary and/or additional impediment to development. This overlooks the fundamental point that such a cost is a properly attributable cost of mining. Indeed, the majority of the industry shared AMIC's acceptance that governments are entitled to require performance guarantees during the mining phase of a project and for minesite rehabilitation. However, many participants suggested bonding arrangements should be flexible and in particular should:
• provide for progressive repayment of the bond over the life of the mine as identified rehabilitation criteria are met;

• be provided as bank or parent company securities rather than as cash; and

• spell out well-defined criteria for when the obligation is discharged (i.e., the circumstances in which satisfactory rehabilitation is deemed to have been carried out).

The Commission accepts the need for some flexibility in bonding arrangements, provided this is not taken too far (e.g., just relying on a company's 'good name') as this would undermine the reason for requiring the posting of such bonds in the first place.

_Provision of suitable land-tenure classifications could assist rehabilitation_

Incentives to rehabilitate may also be blunted by inflexibility in land-tenure systems imposed by governments. For example, one participant, L. Lawrence (sub. 78), considered that currently there was a lack of incentive for miners to rehabilitate in the Northern Territory, largely because of artificial legislative restrictions on land uses during and following mining. He suggested, for example, that multiple land-use leases would provide an incentive for miners to maintain infrastructure on site (e.g., spillways and silt catchments) and use overburden removed in such a way as to progressively develop an agricultural venture post mining. At Pine Creek in the NT, for example, considerable potential for growing mangoes on mining land was said to exist, but has been frustrated by the lack of suitable tenure land. Providing miners with an incentive and opportunity to establish long-term commitments and embrace multiple land-use concepts (e.g., through the acquisition of pastoral leases), may allow a strengthened social and economic structure locally, and long-term utilisation and return on government-provided infrastructure.

_How should environmental effects of extraction and on-site treatment be handled?_

_What are the problems?_

Apart from disturbance to land at the minesite itself, the main environmental effects of this stage of the mining process are the generation of wastes which are often disposed of into the local environment (e.g., vented into the atmosphere or flushed into local waterways). As noted by the Department of Arts, Sport, the Environment, Tourism and Territories (sub. 65, p. 7), "the mining industry needs to accept that although effects of mining on the environment may appear localised, the ecology is inter-linked and that the effect of mining processes on the species or habitat in one area may affect more that the local ecology (e.g., heavy metals or other pollutants may enter a river and cause the loss of a species or fish or other aquatic animal)."

The beneficiation of minerals generally involves crushing and grinding. These activities may generate airborne particulates and noise, as well as 'tailings' which are generally run off into dams. Major waste disposal problems are associated with tailings which may be distributed by wind and water erosion over wide areas. Also, leaching can produce significant water pollution.
The Total Environment Centre cited (sub. 10, p.14) the former Rum Jungle uranium mine as an example of this, alleging that:

The sulphide-rich ore was left to oxidise, producing a nasty cocktail of sulphuric acid and heavy metals. These leachates flowed directly into the Finnis River. Traditional Aboriginals live downstream and to our knowledge still eat fish and mussels from the river.

Participants provided numerous other examples of the effects of mining on the natural environment (see Volume 4, 'Mining and the environment'). The Toxic Chemicals Committee of the Total Environment Centre (sub. 92, p.1) considered that copper mining at Queenstown, uranium mining at Rum Jungle, recovery of metals from sulphide minerals at Captains Flat and Port Pirie and asbestos mining at Wittenoom were examples of 'catastrophic impact'.

These types of external environmental effects clearly involve considerable costs to society.

There is however, a need to put the environmental consequences of mining in context. The NSW Government noted (sub. 217, p.17) that:

... Captains Flat, and many other such areas of Australia, are examples of mining undertaken in times when there was no regard or respect of the environment by mining and other industrial activity and no requirement for rehabilitation. Such a situation could not occur today under current regulations in New South Wales. It is this common perception that all present day mining gives rise to Captains Flat type situations that the mining industry has to face.

Similarly, while AMIC (sub. 229, p.27) acknowledged that the industry has a poor public image in so far as its environmental effects are concerned, it pointed out that the industry's environmental management capabilities are being increasingly recognised by the community. It claimed that a study it commissioned from G. Webb Pty Ltd on 26 representative mining operations found, inter alia, that no known species of flora or fauna in Australia is known to have become extinct or is threatened with extinction as a consequence of mining, and that there are no known examples where genetic diversity has been reduced as a consequence of mining.

There was no evidence presented to the Commission that modern mining practices are inconsistent with sustainable development (including ecologically sustainable development).

Why have environmental problems arisen?

In the past mining was frequently perceived as the only activity placing demands on the assimilative capacity of the local environment, particularly in many remote or inhospitable locations. This often allowed the mining industry, and governments as the owners of the minerals, to ignore the costs associated with the use of the environment by mining (and other activities) and behave as if only benefits accrued from such a use. In economic jargon, the failure to define or enforce property rights over the use of services provided by the natural environment leads to 'externality' problems.
The problem with externalities is that they cause markets to misallocate resources. The full cost of mining activities includes any adverse effects on the environment, but miners may have little or no incentive to take into account such costs (e.g., the effects of leachates on Aboriginal communities downstream from mining operations). Failing to account for such costs, as pointed out by the Australian Conservation Foundation (ACF, sub. 68, p.11) "... represents a subsidy paid from the stock of environmental capital."

This situation has changed, partly as a result of increasing population straining the capacity of the environment to serve as a universal waste sink, greater affluence and mobility boosting the demand for amenity services, and growing awareness of the importance of the environment as a life support system. Thus, society quite validly insists now that the costs associated with any particular use of the environment be taken into account along with the benefits. In the words of the Environment Centre of the NT (sub. 126, p.2):

> The entire social and environmental cost must be evaluated in order to determine the value that the mining industry makes to our society ... There are untold costs that are being [left] for future generations.

An obvious question to ask at this point is why these costs have not been adequately taken into account in the past. The Commission agrees with the assessment of the ACF (sub. 68, p.9) that:

> Inadequate supervision of the environmental/economic interface bridged by the mining industry, compounded by inadequately developed pricing methodologies, has meant that many of the economic services rendered by the environment to the industry seem not to be priced or are priced well below cost. This has resulted in overuse of the environmental resource and subsequent degradation - sometimes to the detriment of other economic activities.

What measures can governments take to ensure that the mining industry shoulders its share of the costs of maintaining an acceptable environment?

*Command-and-control approaches need to be supplemented*

The traditional response to the emergence of environmental problems associated with the mining industry (and indeed other economic activities) has been for government to adopt 'command-and-control' measures, including prescriptive regulations, emission standards, technology-based standards, uniform standards, and prohibition.

This type of approach relies on the specification of rules and regulations to which target activities (in this case mining) must conform. The Total Environment Centre (sub. 10, p.4) stated that:
Effective regulation remains the essential duty of government because private corporations, which are primarily responsible to their shareholders, may not adequately consider the benefits to the public of protecting the environment and public health. Left to themselves, multinational mining corporations would invest relatively little in environmental safeguards.

It went on to suggest that "methods of mine-waste management which risk damaging the environment (e.g. ocean and river dumping) should be prohibited" and that "for all mining operations, criteria should be established to ensure zero release of contaminants which harm the environment in either the long or short term."

Prohibition and prescriptive regulations may not, however, lead to least-cost solutions to environmental problems. The Environmental Protection Authority of Western Australia, in noting that it places emphasis on protecting the environment by setting objectives, rather than by specifying mechanisms commented that in its experience, "developers usually are the best people to work out how to meet environmental objectives, rather than have this regulated."

Compared with market-oriented mechanisms, command-and-control measures have two main advantages. First, their use makes more certain that the potential for damage to the environment will not go beyond the specified level (but see below). Second, when implemented as prescriptive regulations, they are easier to enforce.

On the other hand, 'command-and-control' approaches have numerous disadvantages, including the need to determine individual standards for each source of pollution, and their failure to provide those being regulated with much (if any) incentive to innovate. This type of approach also tends to conceal compliance costs, which leaves policy-makers free to ignore the costs and constraints of what they are advocating when they set environmental standards. Moreover, command-and-control mechanisms may not fulfil their main objective of protecting the environment, because they may not prevent pollution exceeding desired limits when the polluting activity expands its production, even if individual standards are met.

**Market-based approaches should be tried where feasible**

One approach which is generating much interest is harnessing market forces to protect the environment. Indeed, a recent government discussion paper (Commonwealth of Australia 1990) recognises that "...it would now appear desirable to pay more attention to the contribution that economic analysis and market-based measures could make to achieving environmental objectives efficiently and effectively." Instead of mandating prescribed actions, which has typified purely regulatory (command-and-control) regimes that have hitherto predominated, this approach seeks to achieve environmental objectives more efficiently by changing the economic incentives facing those whose actions have the potential to harm the environment. This can be done with fees or charges (the 'polluter pays' principle), transferable pollution permits, performance bonds (akin to those for rehabilitation discussed above), or by holding companies legally liable for any unacceptable damage they cause. By changing the nature of incentives facing those whose activities have the potential to harm the environment, the individuals involved can draw on their typically superior knowledge of their production processes to select the best way of meeting their assigned responsibilities.
Market-based approaches:

- require little or no need for government to set and implement standards for individual users;
- discourage use of environmental services by firms which derive least benefit from that use; and
- provide stronger incentives to innovate than under command-and-control systems.

The ACF (sub. 68, p.14) observed that "it is only by charging for the economic services provided by the environment that the mining industry will be motivated to research and abate the problem."

The fact that little operational experience with such mechanisms currently exists is not a valid argument for not implementing them (or at least experimenting with them). However, there may be some justification for introducing market-based measures incrementally at selected locations dealing with a limited number of environmental disturbances, so as to provide insights to guide their more widespread application. The NSW Government (sub. 217, p.17) has foreshadowed greater reliance on economic instruments in achieving environmental ends, but recognises that "such programs need to be developed carefully and in consultation with industry to ensure that such mechanisms are practical and effective, and are phased in to minimise uncertainty to industry."

A more detailed discussion of the potential for relying more on market-based mechanisms to accomplish environmental objectives is at Section 7 of Volume 3.

Many mining-related environmental problems occur because of ill-defined property rights and obligations which are either unenforced or unenforceable. However, not all problems will necessarily be solved even if property rights are better defined, because of the presence of externalities not amenable to the exclusive assignment of rights - as well as the 'public good' nature of some environmental services. Nevertheless, the Commission is of the view that, if governments intervene to correct for market failures, market-oriented mechanisms based on enforcing or defining property rights (eg effluent charges or tradeable pollution permits) be generally preferred to 'command-and-control' approaches.

Office of the Supervising Scientist

The Commission received considerable evidence on the role and effectiveness of one particular government agency with responsibilities in the environmental area - the Office of the Supervising Scientist (OSS).

OSS is responsible under the Environment Protection (Alligator Rivers Region) Act 1978 for advising the Commonwealth Government on measures which would protect the environment of the Alligator Rivers Region of the Northern Territory (part of which comprises Kakadu National Park) from the effects of mining, as well as promoting and assisting in the establishment of regulatory regimes which meet Commonwealth requirements. OSS has no regulatory authority or powers of enforcement, as the responsibility for much of the administration associated with environmental protection in the Alligator Rivers Region (the Region) has been assigned to the NT Government under Working Arrangements agreed to by the Commonwealth and NT Governments.
Three NT agencies function as Supervisory Authorities with respect to mining in the Region, the Conservation Commission and the Departments of Mines and Energy and Transport and Works. The Supervisory Authorities are responsible under NT law for managing the regulatory regimes defining the operational conditions under which mining may take place in the Region. Under the National Parks and Wildlife Conservation Act 1975, the Australian National Parks and Wildlife Service (ANPWS) has developed a management plan for Kakadu National Park which it administers on behalf of the Commonwealth Government.

There may be no problem with these arrangements if OSS merely had an advisory role, leaving the Supervisory Authorities to supervise regulation and enforcement. However, the legislation under which OSS functions stipulates that OSS has the responsibility to inform the relevant Commonwealth Minister on the effectiveness with which regulatory regimes are being implemented by the Supervisory Authorities, any deficiencies which are observed, and the degree to which compliance with the regulatory regimes is being achieved. On the other hand, under the Working Arrangements, the NT authorities are only required to consult with and have regard to the views of OSS as distinct from acting on them. The Co-ordinating Committee for the Region was set up to resolve by discussion any differences between parties which have a role to play in the protection of the environment of the Region.

There is no formal mechanism by which OSS could ensure with certainty that its views would be acted upon by the Supervisory Authorities. Indeed at the time OSS was set up, it was intended it would have a co-ordinating role, rather than any suggestion of directing government agencies operating in the Region. While the current legislation ensures that the Commonwealth interest is protected, it also ensures that the Northern Territory cannot confidently exercise all the powers of a regulatory authority. This arises since OSS can and does intrude into the regulatory process by having (and sometimes having enforced) views differing from those of the Supervisory Authorities on important aspects of environmental protection, particularly by adopting different interpretations of Environmental Requirements.

There are substantial problems in the administration of mining activity in the Alligator Rivers Region due to overlapping responsibilities held by the OSS and NT regulatory authorities (eg the NT Department of Mines and Energy).

This state of affairs has placed the most significant mining company involved (Energy Resources of Australia Ltd - ERA) in a position where there is no clear authority and no certainty as to what is the most appropriate course of action to take. This is an untenable position. For example, if ERA abides by directions issued by the NT Supervisory Authorities, it can be criticised by OSS. Consequently there has been a number of ongoing battles between OSS, ERA and the NT authorities. Examples of the extent to which communications between OSS and ERA have sunk are set out in Volume 4, 'Office of the Supervising Scientist'.

To overcome these problems, the Commission believes that different management regimes should be established for the area within the outer perimeter of Kakadu National Park and the remainder of the region. This would involve the abolition of the co-ordination role and a reassignment of the supervisory responsibilities of OSS, coupled with a renegotiation of the Working Arrangements between the Commonwealth and NT Governments.
The Commission recommends that:

- the functions of the Australian National Parks and Wildlife Service be expanded to accommodate the supervisory interests of the Commonwealth Government in the environmental management of Kakadu National Park (as presently exercised by the Office of the Supervising Scientist);

- the regulatory responsibilities of the NT Government for mining and mineral exploration activity in the Alligator Rivers Region be clarified;

- The Office of the Supervising Scientist's research functions be transferred to competent scientific bodies (eg the Commonwealth Scientific and Industrial Research Organisation or the Australian Nuclear Science and Technology Organisation) and funded on a user-pays basis;

- charges to cover environmental monitoring and protection of Kakadu National Park be levied on all users whose activities affect the Park (eg the township of Jabiru and visiting tourists), rather than being confined essentially to the Ranger uranium mine.

In exercising its environmental management function with respect to pollution in the Region, one market-based approach would be for ANPWS to establish acceptable ambient levels of all forms of pollution in the Region (and the resulting acceptable input rates of pollution) on which to base a system of transferable pollution rights among all users of the region, including ANPWS itself.

A more detailed discussion on the roles of the OSS and NT authorities in relation to environmental protection policies affecting the Region, including the level of duplication between these organisations is at Section 24 of Volume 3.
In recent years there has been a growing recognition that Australia's reliance on export income from primary production leaves it exposed to the vagaries of, at times, quite volatile commodity markets. As a result, there have been increasing calls to further process raw materials into manufactures which trade at less variable prices, at the same time adding value within Australia. Advocates of this strategy note that proportionally more value is added in subsequent processing operations, holding out the prospect of greatly increasing the value to Australia of its natural resources. Moreover, at present many processing activities are carried out overseas - so that Australians are denied the additional benefits (such as increased income and employment) which would be realised if further processing occurred locally. Some would pursue this approach to the point of advocating further processing of raw materials regardless of the competitiveness of the resulting products. Such an approach would be counterproductive. Further processing is only worthwhile if the resulting processed outputs can be sold profitably on domestic and more particularly world markets. And therein lies the problem. This chapter looks at some of the reasons why (potentially viable) further processing of our raw materials is not occurring, and identifies ways of encouraging what most Australians would agree are desirable economic activities.

Following extraction, minerals are traded having undergone various degrees of processing. Aluminium provides a good example. The value-added chain progresses from bauxite to alumina to aluminium metal (and ultimately to products made from or containing aluminium) - all of which are traded internationally and all of which we trade. One myth that should, perhaps, be dispelled at the outset is that very little value is added to our minerals domestically (ie the widespread belief that Australian mining is essentially just a quarrying operation). In fact, quite a deal of processing already occurs in Australia (see Appendix C of Volume 2). Nevertheless, much more could be done in the way of further processing in this country.

Should further processing of minerals be encouraged regardless of the cost? Why don't we add more value to our minerals? Are government-provided inputs to further processing - such as electricity - being supplied efficiently or are they impeding such activities? Is the cost of coastal shipping a problem? Is processing disadvantaged by its treatment under the taxation system? Does the general structure of assistance penallise processing? What about import restrictions in other countries? Is the cost of capital a problem? Do we have access to appropriate technologies to undertake further processing here? Are labour costs unnecessarily high? How should environmental concerns associated with the undertaking of further processing be handled? These are all questions which this chapter addresses.

7.1 Should further processing of minerals be encouraged regardless of the cost?

Australia's ability to produce and export value-added commodities is generally considered to be particularly important for our economy. According to this view, production and export of more processed goods (incorporating greater added value) would improve our balance of trade by
increasing exports, while at the same time reducing imports (as increased local production displaced goods formerly sourced overseas). These developments, so the argument goes, would mean a stronger Australian dollar and greater domestic and foreign investment. In many cases, further processing would also provide greater employment opportunities than concentration on mining, as such activities are generally more labour intensive.

Despite such obvious advantages, blind pursuit of more value adding activity in Australia may not always be a sound strategy. The structure of our economy, as with all economies, is such that Australia enjoys a comparative advantage over international competitors in producing certain commodities. Such commodities usually dominate a country's exports, with imports mainly comprising goods and services in which the country suffers a comparative disadvantage if it insists on producing them. By concentrating on goods we can produce most economically and exchanging (via international trade) amounts excess to our requirements for those we are not so good at producing, we gain (as, by analogy do those with whom we trade). To artificially encourage value-added activity in areas that can be served more cheaply by imports is illogical and will ultimately translate into falling living standards. Thus, while adding more value to our minerals has potential advantages, to increase processing at the expense of other more profitable activities is not in the national interest. In the words of BHP (sub. 67, p.11):

The processing of minerals to add value should be determined by prudent business evaluation of benefits and risks in servicing identified market demands. Projects aimed at political or social objectives which do not meet commercial imperatives should not be encouraged.

7.2 Why don't we add more value to our minerals?

While nature has contributed much to our comparative advantage in mining (by blessing us with many world-class mineral deposits located relatively close to the surface and to the coast), the determinants of comparative advantage in minerals processing are much less a matter of good luck.

The extent of any comparative advantage Australia may have in minerals processing is determined by a wide range of factors. These fall into two broad categories: those 'natural' factors about which little can be done (eg being geographically distant from many important world markets); and impediments which are more 'artificial' and which are therefore within our own power to influence.

Australia's sheer size and relatively small population (most of which is concentrated in just a few coastal cities) poses natural obstacles to mining and more particularly mineral processing activities.

These largely stem, in the case of mining, from the difficulties and associated cost of transporting and attracting necessary inputs to production (such as capital equipment and skilled labour), supplying necessary energy (since processing minerals at the minesite is typically energy intensive) and establishing communications between populated coastal regions and the often remote sites where deposits have to be mined.
In the case of further processing of minerals, this tyranny of distance takes the reverse form, that is, often having to transport vast quantities of semi-processed mine outputs to more populated areas, where the necessary infrastructure is available to undertake further processing. Unless efficient transport services (mainly coastal shipping) and bulk-handling facilities are available, just having to pay inflated transport bills may so undermine the economics of further domestic processing to the extent that it only makes sense to export semi-processed mine outputs from the nearest port.

Australia's remoteness from certain overseas markets (e.g., North America and Europe) may also represent a constraint on both mining and mineral processing by raising questions from the point of view of potential buyers about timeliness and the security of supplies that have to be transported vast distances. Another possible constraint is the small size of Australia's population - which means that the domestic market alone is insufficient to allow realisation of size economies which may be available. For example, the (WA) Department of Resources Development (sub. 48, p.9) noted that about 30 per cent of the output from each of the Burnie and Bunbury titanium dioxide plants fully satisfies the domestic market.

We do, however, possess some attributes which can make further processing of minerals an in Australia attractive proposition. In this regard the Economic Planning Advisory Council (EPAC 1988) considered that comparative advantage in processing depends essentially on two factors: an ability to locate processing plants close to both the source of raw materials and the market for the proposed product; and access to essential resources - such as energy, infrastructure and other capital. EPAC concluded that:

> Australia's relatively abundant natural resource endowment, together with its strong infrastructure base and stable social and political environment, provide it with a clear comparative advantage in the early-stage processing of many primary products.

Aluminium was cited as an area of clear comparative advantage. It has been estimated that, if all bauxite and alumina produced in Australia were transformed or manufactured to aluminium prior to export, Australia could earn a further $10 billion annually in export earnings (Basic Metals and Minerals Processing Industry Council 1990). Another area of considerable potential is processing of mineral sands and rare earths - zircon sells for $300 per tonne while high purity zirconium sells for more than ten times that amount.

In essence, while there must be reservations as to the merits of increasing the value added to minerals as an end in its own right, Australia does appear to have several pre-requisites which suggest we should enjoy a comparative advantage in at least the early-stage processing of certain minerals. From the point of view of this inquiry, the big question is whether we squander potential advantages by erecting largely artificial impediments to further processing of minerals in this country. After all, the processing of minerals has a much wider choice of world locations than does mining.

### 7.3 Is the cost of transporting minerals excessive?

Because of the economic geography of Australia, whereby minerals often occur in remote parts of the continent and therefore have to be transported over long distances if they are to be further processed domestically, having an efficient transport system is more important to us than it is for most other countries. Thus the efficiency (and therefore the cost) of domestic transport systems is
clearly of crucial importance when it comes to deciding whether it makes sense to further process minerals in Australia.

Desirable reforms of rail and road transport have already been discussed in some detail in Chapter 6 (and are discussed in further detail in Section 16 of Volume 3), since these modes of transport must be used extensively - regardless of whether minerals are being transported to undergo further processing in Australia or are being exported in semi-processed form. Apart from being justifiable as an end in its own right, the need to promote competition between and within transport modes applies with even more force when it comes to encouraging further processing of minerals, because transporting mine outputs over long distances is virtually a pre-requisite to such activity in Australia. One mode of transport not previously discussed but which is very important to mineral processing is coastal shipping.

Coastal shipping has a lot of headway to make up

While rail is, of necessity (given the size of the task), used to transport most mine outputs to port, coastal shipping is similarly used to transport minerals destined to undergo further domestic processing.

For various reasons, it is often not practical to locate processing plants near mine sites. Ores must therefore be transported between the mine and the site of the next stage of processing. After a rail (or sometimes road) journey to the nearest port, coastal shipping is generally the only practical means of transporting ore if further processing is to take place in Australia.

Many participants cited excess shipping costs as a major impediment to further processing. MIM Holdings Ltd (MIM, sub. 19, p.17), for example, claimed that:

The dimension of the problem is shown by the relative shipping rates - to ship refined copper from Townsville to Yokahama or London costs approximately $A60 per tonne, whilst from Sydney to Auckland by Australian shipping costs $A130 per tonne.

A common view of participants was that put by Barrack Specialty Metals (Barrack, sub. 75, p.10):

High coastal shipping rates are a major impediment to further processing in Australia, since it is often cheaper to export raw materials for further processing than to transport them to an interstate port ... To assist Australian companies to compete on overseas markets, the Government needs to expedite shipping and waterfront reform.

Normandy Poseidon submitted (sub. 11, p.8) that development of its feldspar deposit at Pippingarra near Port Hedland (see Box 7.1) provided a clear example of the "impact of the Australian cost structure on mining and processing, compounded by the tyranny of distance."
Box 7.1: The Pippingarra feldspar case

The Pippingarra mine is being developed as a major source of premium grade feldspar for Asian markets. Raw product will be trucked 30 km to Port Hedland and shipped in bulk to Asian ports for further processing. Normandy Poseidon claimed that Australia's high coastal shipping rates and its high cost and inefficient port unloading facilities (plus a lack of container shipping facilities at Port Hedland) preclude shipping the raw product to Australian ports for further processing for domestic markets, let alone for export. Even though the operators own a feldspar processing plant at Port Welshpool, Perth (where it processes similar material trucked from a higher cost mine at Mukinbudin, near Southern Cross), the cost of shipping from Port Hedland to Port Welshpool is too great to permit processing at Port Welshpool. In short, the Pippingarra mine can only be developed as a producer of minimally processed material with the bulk of the value being added overseas.

Source: Normandy Poseidon Group (sub. 11, p.8)

The Industries Assistance Commission's recent report on coastal shipping (IAC 1988b) also identified the high price of shipping as a significant barrier to further processing of Australia's minerals. The Basic Metals Industry Council's report on raw materials processing (BMIC 1987) also considered that coastal shipping costs represented a significant constraint on the processing of copper, lithium, magnesium, zinc, and kaolin.

What has been done?

Problems with the cost of shipping services are not unique to the mining and minerals processing sector, since they impede the development of all industries which use (or would like to use) this mode of transport. Governments have responded to shippers' complaints by setting up a number of inquiries into the efficiency and competitiveness of shipping and related services.

These inquiries have proposed a myriad of reforms aimed at improving efficiency and reducing costs - primarily through modifications to work practices and the introduction of competition. A common theme of these inquiries has been that significant cost inefficiencies exist because of the absence of effective competition in the supply of shipping and cargo-handling services. For example, the Commission concluded in 1988 that if international freight rates applied to the Australian coastal trade, then freight rates covering the ship and shore-based segments of the industry would be 20 to 50 per cent lower in most years. Analysis in Appendix F of Volume 2 estimates that if inefficiencies in coastal shipping and waterfront activities were removed, Gross Domestic Product would increase by $700 million annually. In particular the mining and minerals processing industries are estimated to increase output by 0.3 and 1.4 per cent respectively.

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1 Recent inquiries into coastal shipping and the waterfront include: the Crawford Committee, the Maritime Industry and Development Committee, the Shipping Reform Task, the Waterfront Industry Reform Authority, the IAC's Coastal Shipping Inquiry, and the Inter-State Commission's Waterfront Investigation.
Since then, Commonwealth and State governments have attempted to address the problems highlighted by and recommendations of previous reports, including:

- A report by the Inter-State Commission released in April 1989 proposing reform of the waterfront including: introduction of enterprise-based employment; reductions in the size of the workforce; reforms to the conduct of industrial relations; and changes to the operation of container depots, bulk terminals, port authorities, land transport access arrangements and ship services.

- Establishment of the Waterfront Industry Reform Authority (WIRA) on 1 July 1989 to negotiate with waterfront unions and employers, with the aim of reaching within a three month period an 'in-principle' agreement on the extent and pace of change. The agreement reached in September 1989 provided for the introduction of enterprise-based employment contracts, the retirement of 3000 employees and the employment of 1000 new employees, over a three year period.

- Recent developments at the State and Commonwealth levels involving port authorities adopting a more commercial approach to their operations.

- A direction to the Prices Surveillance Authority to monitor coastal shipping freight rates to ensure that improved efficiencies resulting from crew reductions and other reforms are passed on to the users of waterfront services.

- Changes to the voyage permit system (whereby foreign ships can undertake coastal trade under certain circumstances), including reintroduction of continuing voyage permits and an easing of conditions attached to single voyage permits.

- The Industrial Relations Commission announced on 12 July 1990 that a single award would now cover the waterfront industry. This will allow for completion of enterprise-based agreements by the end of the year, and replacement of 20 former awards by a single one.

What more should be done?

While the initiatives outlined above may lead to increased productivity by reforming some of the fundamental structural rigidities (such as restrictive work practices) that have become virtually institutionalised in coastal shipping and the waterfront in this country, the Commission is concerned that mooted reforms do not address what it sees as one of the main reasons for excess shipping costs - namely, a lack of competition.

The WIRA process is not due to be completed until June 1992, three years after its instigation. Even then there is no guarantee of successful implementation of the 'in-principle' agreement. Indeed, a recent report released by WIRA (1990) said that the process of award restructuring in the industry was lagging behind schedule, with the relevant unions avoiding negotiations that would result in any reduction in employment conditions.

As a result of recent Commonwealth Government initiatives, coastal shipping should achieve significant efficiency gains. The maritime unions have made important concessions which would
reduce crewing on new ships to levels more in line with those of other OECD countries. Importantly, they have also agreed to a review of crewing on existing vessels through a consultative process. For their part, the shipowners have agreed to contribute to redundancy packages resulting from reduced crewing and to training/retraining initiatives. WIRA estimated that reductions in ship operating costs likely to result from these initiatives will ultimately be of the order of $50 million annually. Despite these apparent achievements, the industry cannot afford to be complacent. Australia is starting from behind and must improve faster than other potential suppliers of shipping services if the competitiveness of users of such services is to improve.

The Government's $154 million waterfront assistance package is contingent upon satisfactory agreement being negotiated on a wide range of issues, many of which remain contentious. The effectiveness of this package will only become apparent over time. If unsuccessful, the government has made clear its intention to pursue alternative measures to bring about desirable structural change.

If Australian industry is to benefit from these reforms, the resulting cost savings must be passed on to the users in the form of lower freight rates. The reforms achieved and proposed have been and are being undertaken within the existing frameworks involving minimal competition. Most users agree with the Commission that worthwhile and enduring reform will only come through fundamental changes directed at exposing the industry to real competition. Greater competition (or even possibly just the threat of competition) would force changes to institutionalised practices and provide exactly the same incentives for improved performance as apply to most Australian industries. If the current strategy - of directing reform at previously identified inefficiencies, followed by lengthy rounds of review, consultation and implementation - continues to be pursued without introducing direct competition, then the gap between Australia's shipping and handling costs and those of its competitors is likely to widen.

The Commission recommends that coastal shipping operations be subject to foreign competition and that competitive disciplines be brought to bear on port and waterfront activities to the maximum possible extent.

7.4 Are excessive energy costs discouraging mineral processing in Australia?

Minerals processing is usually energy intensive, with energy costs for some processors constituting up to 40 per cent of variable operating costs (see Box 7.2). Many participants in this inquiry stressed the importance of energy to their operations. For example, MIM (sub. 19, p.14) emphasised that "access to low-cost power is essential to maintain competitiveness" and the Cement Industry Federation (sub. 46, p.7) observed that "energy is the most significant variable cost to the industry after transport and possibly raw materials".

The provision of electricity by governments provoked most comment about high energy costs, not only because it is the major energy source used by mineral processors but also because it is widely believed that there is considerable scope for improvements in the efficiency with which it is supplied. While Australia's electricity prices to industrial users are not high when compared to many developed countries (eg Germany, Italy, USA, and Japan - see IC (1991, Vol II, p.20), many
believe they are unnecessarily high given the natural advantages the domestic industry enjoys in terms of access to relatively cheap high-quality coals. Many participants suggested that electricity prices are sufficiently high to impede the development of processing activities. For example, the NSW Chamber of Mines, Metals and Extractive Industries (sub. 37, p.11) considered that "High electricity costs are inhibiting the development and growth of existing operations and are a disincentive to attracting new minerals processing industries.". MIM's view on the effects of inefficient provision of energy on further minerals processing is presented in Box 7.2.

**Box 7.2: The importance of energy to further processing**

Electrical energy in metal processing facilities can account for up to 40 per cent of total operating costs. Consequently access to low-cost power is essential to maintain competitiveness. Although Australia has abundant reserves of low-cost high-quality coal and natural gas, labour costs and government cost/revenue impositions have inflated their conversion costs to uncompetitive levels. For example, despite electricity tariff concessions by state electricity commissions, major new downstream users such as an electrolytic zinc refining or aluminium smelting plant would need to allow for power costs in excess of 3 cents per kilowatt hour (cpkwh). By comparison, such plants in Italy would pay approximately 2.4 cpkwh, whilst in Canada several downstream zinc producers are paying only 1.05 cpkwh. And in France, a proposed aluminium smelter at Dunkirk will enjoy electricity at just 1 US cpkwh. The inefficiencies that are severely affecting Australian energy costs must be eliminated if energy-intensive projects or zinc-refining plants - with their huge potential for the export of high-value added metal and a substantial contribution to Australia's export income - are to be established in this country.

*Source:* MIM Holdings Ltd (sub. 19, p.14)

It should be noted, however, that electricity charges overseas do not represent an appropriate benchmark against which to measure the efficiency of electricity supply in Australia (eg because of differing energy sources such as hydroelectric or flare-gas or because of subsidisation of prices in some countries). The real question is: can we do better given our particular circumstances (in terms of access to raw material inputs, the cost of plant etc)? Evidence given to the Commission during this inquiry supports the findings of previous studies - both by the Commission and other bodies - that there are inefficiencies associated with both the production and pricing of electricity in Australia. Analysis in Appendix F of Volume 2 estimates that, if the electricity supply industry's performance were to reach international best practice and cross-subsidies between users were eliminated, national output would expand by some $2.5 billion annually. Processing bauxite into alumina and more particularly alumina into aluminium would be a particular beneficiary of more efficiently produced electricity.

**Inefficiencies in the public provision of electricity are adversely affecting the competitiveness of mining and mineral processing industries.**

These inefficiencies in production and pricing practices are largely attributable to electricity authorities being insulated from effective competition. Regulation of private providers of energy (eg in the case of gas) may be having the same effect. Furthermore, the authorities are faced with conflicting objectives - government interference in how electricity stations are operated and pricing policies instituted by governments aimed at achieving welfare and regional development objectives.
What should be done?

In recent years, governments have initiated programs aimed at improving the efficiency of government business enterprises in the energy area. Approaches adopted include: restructuring of electricity tariffs to more closely reflect the relative costs of supplying various classes of customers, initiatives to increase labour productivity (e.g. through removal of unproductive work practices and reduced labour requirements); introduction of corporate plans specifying clear objectives and performance targets; and less Ministerial intervention in day-to-day decision-making.

While some improvements have been made in recent years, the Commission is convinced that considerable scope exists for achieving significant further improvements in the electricity supply industry by promoting competition within the industry (e.g. through open access to the transmission grid, more private electricity generation, and stronger interstate connections).

The Commission is examining these and other ways of increasing efficiency in the electricity (and gas) industries in its separate inquiry into energy generation and distribution. The Draft Report from that inquiry was released in January 1991, while the final report is due to be sent to the Commonwealth Government by 21 May 1991.

A more detailed analysis of energy-related issues is at Section 18 of Volume 3.

7.5 Is processing disadvantaged by its treatment under the taxation system?

A significant cost affecting the competitiveness of Australia's processing projects is the level of taxation that companies are required to pay to governments (a detailed discussion of taxation matters is contained in Section 13 of Volume 3). CRA Ltd, for example, cited the Basic Metals Industry Council's view (BMIC 1987) in its submission (CRA, sub. 73, p.142) that "taxes, charges and regulations imposed by all levels of government inhibit the development of further processing". Several participants echoed the arguments of Barrack (sub. 75, p.3) that "to attract investment in further processing of minerals, the business environment must compare favourably with competing countries, who are offering substantial incentive packages in order to attract export-oriented industries". The provision of low-cost energy, cheap labour, generous tax holidays and soft loans were cited as examples of incentives offered elsewhere.

Australian taxes are mainly used to finance spending in support of community welfare goals - a level of per capita spending which may be quite different to countries such as South Africa or those in East Asia or Latin America (examples given by EPAC as processing competitors). To change tax rates to match those applying overseas may lead to further processing of minerals in this country (among other effects), but would impose costs on other industries as a disproportional tax burden would have to be imposed on others if the Australian Government were to continue to raise the same dollar amount of taxes as previously.
While the Commission acknowledges the high tax burden prevailing in Australia relative to some of our competitors, it does not believe that Australia should attempt to match concessions offered by others.

One tax issue raised by participants which is specific to the processing industry concerns the treatment of processing plants located at a minesite. CRA (sub. 73, p.143) noted that housing and welfare facilities constructed at the minesite by a mining company for its employees (including those working in an associated processing plant) are tax deductible over ten years. If however, the processing plant is not owned by the mining company, or is located at a distance from the minesite (eg at the port of export) no such tax deductions apply. The Commission is not aware of any reason why such a distinction should be made. Such an anomaly provides incentives for companies to vertically integrate (ie become involved in each stage of processing) which, in certain instances, may be less efficient than processing by independent parties.

The Commission recommends that expenditures on housing and welfare directly related to mining and mineral processing operations be deductible for company tax purposes where Zone Rebates apply for income tax purposes.

As is the case for other manufacturing industry, the cost of feasibility studies for proposed mineral processing plants are capitalised over the period of the project. If no project eventuates no deduction is available. The Commission agrees with this treatment (and regards this view as not inconsistent with its view - see Chapter 6 - that expenditures on feasibility studies which are essentially exploration related should qualify as an immediate deduction, along with other expenditure on exploration activities).

The treatment of plant demolition costs for minerals processing projects also differs for that accorded mining projects. In the 1990-91 Commonwealth Budget, it was announced that mining projects would be permitted to deduct the cost of demolishing plant upon cessation of mining operations. In Chapter 6 the Commission agreed with this view, but also recommended 'carry-back' arrangements if insufficient income was available against which to claim a deduction. In the case of mineral processing activities (and other manufacturing activities) no such deduction is allowed - apart from being able to write off any residual book value on demolition. The different treatments appear to reflect the view that, whereas mining plant would be most unlikely to have any residual value once mining ceases (particularly if the mine is located in a remote area), the same is not necessarily true of manufacturing plant (which is usually located in urban areas).

Accordingly, the Commission recommends that mineral processing projects qualify for a deduction for company tax purposes in respect of the cost of plant demolition (and related costs) in areas where Zone Rebates apply for income tax purposes and that these deductions be 'carried back' for an adequate period if there is insufficient income to claim a deduction in the year in which such costs are incurred.
Does the general structure of assistance penalise processing?

The government has many policies designed to assist domestic industries - such as tariffs, quotas and production subsidies applying to various commodities.

The effect of such direct assistance is to benefit some economic activities at the expense of others. The beneficiaries of such measures are those whose outputs are protected by the assistance afforded, while the losers include those who have to pay artificially inflated prices for necessary inputs to their own production. Industries are also affected indirectly by protective policies, because assistance draws resources into favoured activities which may be potentially more productive if employed in other economic activities.

The degree to which minerals processing activities are prejudiced by assistance to other sectors can be a significant factor affecting competitiveness. Appendix H of Volume 2 details the estimated net effect of the structure of assistance measures on mining including early-stage mineral processing and on total manufacturing.

The average effective rate for the minerals processing sector (ASIC 29) is estimated at 8.6 per cent. This can be interpreted as representing a small gain to processors overall from assistance measures taken into account in calculating effective rates. However, this benefit may not be enjoyed in the case of mineral exporters, depending upon the type of assistance given. If assistance takes the form of raising prices - such as is the case with tariffs on outputs - processors will receive no advantage in exporting, as tariffs only assist domestic sales. Rather, it is the Commission's view that it is insulation from the full rigours of having to compete without assistance that hinders producers from achieving full price competitiveness, as incentives for productivity improvements tend to be dulled by protection. A good example is the manufacturing sector as a whole, which is relatively heavily assisted but is not export oriented.

Calculating assistance at a more disaggregated level reveals substantial variation in protection. For example, the effective rate of assistance for activities classified to ASIC 294 (basic iron and steel) ranges from 9 to 34 per cent; ASIC 295 (basic non-ferrous metals) from -5 to 2 per cent; and ASIC 296 (non-ferrous metal basic products) from 15 to 49 per cent (see Appendix H). Activities under reference in this inquiry therefore receive both relatively high and negative levels of assistance. Substantial assistance will generally dull incentives for efficient industry development, while negative levels will place the industry at an artificial disadvantage. Neither is desirable. The former may result in an environment which, while being an advantage in terms of securing domestic sales, is far from desirable in the case of export-oriented sectors (and may, in fact, militate against their emerging). The latter may be seen as a constraint on achieving both domestic and export sales.

Assistance to one industry advantages it in terms of its ability to attract and retain productive resources, as compared with less-favoured activities. That is, disparate levels of assistance throughout the economy will encourage a distribution of resources that is not consistent with their

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2 ASIC refers to the Australian Bureau of Statistics' Australian Standard Industrial Classification of Australian industry structure.
most efficient use. As the minerals processing sector is lightly assisted when compared to the manufacturing sector overall (around 9 per cent as opposed to 16 per cent), it is likely that resources have been diverted from minerals processing to other less productive manufacturing activities. Indeed, estimates presented in Appendix F of Volume 2 suggest that the lowering of material and labour costs that would stem from the removal of all manufacturing assistance would result in a 4.5 per cent overall expansion of the mining sector, and considerably more in particular resource-based industries (eg alumina smelting and refining output could expand by 7.5 per cent).

This artificial bias could be removed by providing similar assistance levels for all industries. However, to correct this and other problems described above, the Commission supports progressively moving to minimum assistance levels, thereby encouraging Australian industries to concentrate on producing those goods and services in which we enjoy a comparative advantage. Many participants supported this view. The Australian Mining Industry Council, for example, concluded (sub. 29, p.50) that "the only economically defensible approach to increasing the extent of efficient value adding in Australia, is through general reductions in assistance". A start has been made down this path with the Commonwealth Government undertaking to reduce tariffs across-the-board to 10 and 15 per cent by 1992. Further reductions beyond this date have been foreshadowed. The Commission supports this policy of general reductions in assistance.

7.7 What about import restrictions in other countries?

Australian exports of processed minerals are disadvantaged on world markets when other countries impose tariff or non-tariff barriers (such as quotas) on imports. Unlike raw materials, which tend not to encounter significant barriers (with coal being an important exception), value-added products are a different matter, with assistance to local production usually increasing the more elaborately transformed products become.

The Commission supports the Commonwealth Government's continuing efforts to break down such barriers.

Import restrictions imposed by other countries are discussed further in Section 10 of Volume 3.

7.8 Is the cost of capital a problem?

Investment in processing plant requires substantial capital outlays. For example, BHP-Utah is currently spending $103 million to build an electrolytic manganese dioxide plant and recently spent $2 billion to upgrade its steel plant. Pasminco listed possible investments for 1989-94 totalling some $1 billion.

Unlike mining, no special foreign investment restrictions apply to the mineral processing industry. However, capital costs were still of general concern to participants. On this subject Western Mining Corporation (sub. 69, pp.42-3) submitted that:

Current government policy means that the cost of capital in Australia is high relative to many international competitors ... Heavy reliance on monetary policy to alternately stifle or stoke demand is a poor alternative to policy changes which address the fundamental problems of the economy. The cost of capital in Australia will remain high for so long as we ignore the
fundamental problem. While this remains the case, it will severely limit new activity such as further processing of raw materials because such investments need to make returns which exceed the hurdle rates of return necessary to meet the high cost of capital.

7.9 Do we have access to appropriate technologies to undertake further processing here?

Many participants engaged in mineral processing emphasised the importance of having access to appropriate technologies (which, if of non-Australian origin generally have to be adapted to local conditions). For example, North Broken Hill Peko commented (sub. 33, p.11):

Of the whole mining spectrum, the area needing most R&D [research and development] is probably in secondary processing, the `value added' stages that remove some of the `quarry Australia' allegations.

The NSW Government (sub. 52, p.1) maintained that "access to advanced processing technologies is essential to the continued growth of the minerals processing industry". Given the significance of this input, it is important that the market for technology operates to deliver appropriate technologies at an efficient price (this includes importing technologies where this is more cost effective than local development).

In order for the market for research and development (which produces technology) to operate efficiently, a number of market deficiencies need to be addressed. A major problem can be that those who undertake research (particularly of a basic rather than an applied nature) are often unable to capture all the benefits flowing from their work. This is because it can be difficult to prevent others from merely copying innovative solutions to problems developed by others (often despite the protection patents are supposed to provide). Such a situation provides incentives which encourage 'free-riding' on the R&D efforts of others, rather than undertaking the usually risky, frustrating and expensive process of generating, testing and developing ideas of one's own. The outcome is generally underinvestment in R&D. This and other imperfections in the market for technology, together with some of the measures employed by government to correct these failings (such as patents and tax deductions for eligible R&D expenditures), are discussed in Section 20 of Volume 3.

How then has the minerals processing industry been affected by these market difficulties? Some participants (e.g. the Commonwealth Scientific and Industrial Research Organisation (CSIRO) pointed to the relatively low level of spending on R&D in Australia compared with other countries, implying a failure to put in place appropriate incentives to undertake research. Others, for example the NSW Government (sub. 52, p.34), suggested that the best way of improving the situation was to encourage development and adaptation of minerals processing technologies through continued and increased government assistance to the transfer of overseas technologies via offsets policies. The federal Department of the Arts, Sport, the Environment, Tourism and Territories (sub. 65, p.15), recommended that a levy on outputs be applied, with the proceeds to be directed to R&D.

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3 Under the offsets program, overseas suppliers trading with the Australian Government are required to direct activities of technological significance to Australian industry, including manufacturing, export marketing and industrial research and development.
However, while some participants indicated that access to appropriate technologies is not ideal, most thought that it is not a major issue in early-stage mineral processing. Recent reports have taken the same view. For example, EPAC (1988) and BMIC (1987) concluded that access to technology does not generally appear to constrain the development of primary processing. Companies were found to be generally able to find and purchase suitable technologies from overseas and adapt them to suit local conditions. CRA (sub. 73, p.137), for example, noted that while "in many instances, for processing operations where Australia has no experience, it is necessary to import to ensure we have access to the most up-to-date and competitive technology", but that "Australian industry can then adapt and build on that technology for the future".

There are, however, some important examples of Australian R&D programs which have led to the development of new technologies. The ISA Process, a copper-refining technology developed by MIM in conjunction with CSIRO, has been sold in Australia, Canada, the United States, Mexico, Austria and Germany and has generated revenues of $30 million. CRA has entered into a joint venture partnership with the US company Midrex to further develop the HIs melt process in WA for the direct smelting of iron ore. If commercialised in Australia, CRA claimed (sub. 73, p.134) that this $200 million project could lead to significant new export opportunities and, at the least, provide an improved market for iron ore fines - thus upgrading a sizeable proportion of Pilbara iron ore.

While there were some differences of view over the state of technology in the primary minerals processing sector, it would seem that Australian companies have reasonably adequate access to up-to-date production techniques. One issue is whether technology could be produced more cheaply in Australia than if it were imported. If the market for technology is operating efficiently at present, then Australia does not appear to have a comparative advantage in R&D (as most technology is imported). If the government has failed to correct for any market failures, and as a consequence produced an unfavourable climate for local R&D, then mineral processors may be disadvantaged through having to purchase (more expensive) overseas technology. (There was not enough information generated by this inquiry for the Commission to reach a view as to whether or not this is currently the case.)

Access to appropriate technologies is an important factor underpinning continued growth and development of mining and early-stage minerals processing industries. On the basis of evidence available to the Commission, Australian early-stage mineral processing and mining companies appear to have adequate access to relevant technology.

Several participants (eg Queensland Alumina Ltd, CRA, Pasminco, MIM) considered that having to pay import duties on mineral processing equipment was adding unnecessarily (and substantially, given the amounts involved) to the cost of accessing appropriate technology. CRA suggested (sub. 73, p.138) that "the structure of the tariff concession system has meant that local manufacturers can force companies seeking to establish processing operations to take on an economic penalty to import equipment or an effective penalty by way of inferior outdated technology". By way of example, Barrack (sub. 75) noted that it had to pay some $1.2 million duty on imported items for construction of its silicon smelter, in spite of the fact that none of the imported plant and control equipment was available in Australia.
These questions raise broader issues associated with the commercial tariff concession system. The system is currently the subject of a separate inquiry by the Commission, with the final report due to be forwarded to the Commonwealth Government by 8 March 1991.

7.10 Are labour costs unnecessarily high?

In terms of international comparisons, Australian wage costs in the basic metals industry appear even more competitive than those for mining. This does not mean, however, that per unit labour costs do not impede the further processing of minerals in Australia. Indeed, Barrack argued (sub. 75, p.6) that "although labour costs in Australia are comparable with other major developed countries, there is need for an improvement in productivity to match that of our competitors". BHP (sub. 67, Ch.5, p.6) suggested that "the current industrial relations climate in the Pilbara remains a very significant negative for a steelworks development". The impact of labour on the costs of construction of processing plant was also seen as a problem. Barrack (sub. 75, p.7) claimed that:

> During the construction of the silicon smelter at Kemerton, Barrack lost approximately six weeks on account of industrial disputes. The cost to the Company of this delayed commissioning of the plant is difficult to quantify. However, it has been estimated to have reduced the net present value of the project by about 5 per cent. Major financial costs include lost revenue from production and increased interest payments on capital. The Company's ability to supply silicon metal on a reliable basis was also questioned by some of its important customers.

As discussed in Chapter 6, the Commission considers that considerable benefits would flow from the adoption of a more decentralised approach to industrial relations and from the sharing of gains from the removal of restrictive work practices. Section 17 of Volume 3 takes up these issues in detail.

7.11 How should environmental concerns associated with the undertaking of further processing be handled?

Some inputs used in mineral processing - as well as solid and gaseous by-products of the various production processes involved - can be dangerous if not handled/disposed of carefully and properly.

Examples of potentially environmentally harmful inputs used in mineral processing are cyanide and mercury (which are used in gold processing). An example of a similarly harmful by-product is sulphur dioxide associated with copper smelting. The Total Environment Centre (sub. 10, p.2) claimed that "the lunar landscape of Queenstown, Tasmania will probably never recover from copper smelting". But the main concern appears to be the production of solid and semi-solid wastes and the potential hazard they represent in terms of water contamination. Typical of concerns in this area were those expressed again by the Total Environment Centre (sub. 10, pp.15-6):

> Alumina refining uses caustic soda to produce alumina and red mud. Vasts amounts of red mud are produced at Gladstone in Queensland, Kwinana and Pinjarra in Western Australia,
and Gove in the Northern Territory. ... Copper, lead, cadmium and zinc are smelted in Australia. These industries produce toxic acid gasses, and heavy metal rich muds. ... [Cadmium] is produced at Mt Isa as a by product of copper and lead smelting. Worker and public health can be placed at risk if dust or vapours containing cadmium are inhaled as pulmonary oedema and death can occur.

As explained in Chapter 6 and in more detail in Section 7 of Volume 3, the existence of pollution problems reflects in large measure the fact that property rights to environmental inputs are ill-defined (or largely unenforceable). Citing the annual disposal of 200 000 tonnes of Jarosite waste in the Southern Ocean as an example of the perception of low costs with using the environment as a 'waste sink' the Australian Conservation Foundation suggested (sub. 68, pp.11-2) that:

One of the prime areas of environmental concern when considering downstream processing of minerals in Australia is the waste that will be released on to public goods. Commonly called 'externalities' due to the lack of developed markets in public goods the waste is 'externalized' from the production process at some, generally unknown, cost to the environment. In effect the environment is providing an economic service - by acting as a waste sink - that in many cases will allow the output to sell at a lower price than would otherwise be the case if the service was withheld.

This problem - and possible solutions - are analogous to those discussed in relation to the environmental effects associated with the extraction and on-site treatment stage of the mining process discussed in Chapter 6. These issues are also canvassed more fully in Section 7 of Volume 3.

The Commission considers that approaches which harness market forces to the maximum feasible extent - such as effluent charges, performance bonds and transferable pollution permits - are to be preferred to traditional 'command and control' approaches which rely solely on regulation. What method would work best, however, depends on the particular mining and/or mineral processing operation and the threats it poses to the surrounding environment, so that it is difficult to proceed beyond in principle recommendations.

In addressing what may be legitimate environmental concerns, however, it is important for the competitiveness of the mineral processing sector that such concerns are addressed in the most cost-effective way. It will only prove counterproductive in terms of standards of living we as a country can ultimately support if unjustifiably expensive solutions are imposed on mineral processing (or indeed other economic) activities in response to perceived environmental threats.

Similarly, decisions which explicitly or implicitly prohibit outright the undertaking of further processing on environmental grounds should not be taken lightly. For example, (in addition to the three mines policy discussed in Chapter 4), enrichment of uranium in Australia is prohibited by government policy not to permit the development of further stages of the nuclear fuel cycle in Australia. The Australian Nuclear Science and Technology Organisation (sub. 156, p.10) has estimated that enrichment increases the export value of uranium by about two and a half times that of unprocessed yellowcake and that a plant which enriched one third of Australia's currently exported yellowcake could earn an additional $140 million annually in export income.
The Commission recommends that governments in Australia allow uranium to be enriched if a normal commercial opportunity should arise, subject to appropriate environmental and other safeguards.

Environmental approval procedures are complex and add to uncertainty

A number of participants (eg SX Holdings Ltd, CRA, Barrack) suggested that the approval procedures applying to mineral processing projects were a major impediment to efficiency and impose unnecessary costs. CRA suggested that "In Australia we have recently seen a number of major investment proposals shelved or scrapped as a result of an inadequate system of environmental approval". Main problems identified correspond to those for approval procedures applying to mining developments (see Chapter 4): confusion over Commonwealth/State guidelines; political opportunism; intervention by groups with no direct interest in the project; and lack of a time limit for the process. CRA contended that (sub. 73, p.145) that "if we are to be able to process raw materials competitively, the approval process needs also to be competitive". Further discussion of the problems with Environmental Impact Assessment procedures is at Chapter 4 and at Section 9 of Volume 3.
8 MARKETING

Given the predominantly export orientation of the markets for many of Australia's mineral products, government intervention in mineral trade has the potential to influence significantly the competitiveness and efficient development of mining and minerals processing activities. Mineral-related interventions subject to varying degrees of government influence include export controls, export duties, marketing authorities, export assistance schemes, international commodity agreements, and import restrictions imposed by other countries. Such interventions represent attempts to secure some 'market advantage' or to serve other objectives of government (eg to prevent mineral sales occurring at unacceptably low prices). This chapter examines the case for government involvement in mineral trade, and finds little evidence to suggest that existing measures benefit the nation.

What is the nature of the markets for Australian minerals? Does the imposition of export controls benefit the nation? Should governments get directly involved in marketing mineral products? What effects do export duties have on the international competitiveness of our mining and mineral products? How are these activities affected by international trading/commodity agreements? What can governments do about regulation in other countries which restrict market access for Australian mineral products? These are the types of questions addressed in this chapter. (Section 10 of Volume 3 provides a more detailed discussion of many of the issues addressed in this chapter.)

8.1 What is the nature of the markets for Australian minerals?

Australia's mining and minerals processing industries are highly export oriented, with the sector currently accounting for almost half of total Australian merchandise exports. Potential demand for our minerals is largely determined by world economic growth. But just how much of that potential we are able to realise depends importantly on (delivered) prices we can offer potential customers compared with our competitors. This is particularly the case with 'standardised' commodities (such as many metals) which - to be tradeable in volume- have to conform to internationally recognised standards, such as those specified by the London Metal Exchange. In the case of such commodities (particularly low-value ones in relation to their weight or the volume they occupy), transport costs can be such that more distant markets cannot seriously be contested by Australian mineral producers - so that variations in the composition and distribution of growth experienced by our near neighbours to our north have come to play a increasingly important role in determining Australia's mineral export performance. Indeed, newly industrialising countries (particularly in Asia) are accounting for an increasing share of world metal consumption.

Demand is also heavily influenced by technological change. Increased demand results both from new products (eg 'space age' demand for materials such as titanium) and from new applications for traditional materials (eg replacement of glass by metal containers). On the other hand, recycling of used products and new production techniques (eg involving substituting other materials for metals) can reduce the demand for certain minerals (see Section 8 of Volume 3 which contains a detailed discussion of the central role played by technological change in mining and minerals processing).
Australian mining and minerals processing activities are often highly export oriented

Australia's relatively small population (and hence its domestic market) and abundant natural resources mean that many mining and mineral processing projects are predominantly - or in some cases totally - dedicated to exports. Thus, about 80 per cent of Australian mineral production is exported.

Because of this pronounced export orientation, international economic developments - such as variations in world economic growth - have a greater impact on mining and minerals processing than on most other Australian industries. Thus, the health of Australian resource-based industries depends to a significant extent on the world trading environment for minerals, metals and fuels. Pronounced short-run price volatility is a distinguishing characteristic of mineral markets (Slade 1988), and in recent years prices for many minerals have ranged from extreme lows in 1986, to record highs in 1988 (Attachment 8A of Volume 3 examines short- and longer-term trends in the price of selected minerals and their relationship to the general question of mineral scarcity).

The export orientation of the Australian mining sector also means that movements in rates of exchange between the Australian dollar and the currencies of our major trading partners are important determinants of mineral sector competitiveness.

**Australia is a price taker rather than a price maker in mineral markets**

To be in a position to manipulate world markets for a particular commodity to our advantage, Australian producers would have to act in concert to restrict supplies such that the resulting (scarcity-induced) price increases outweighed the revenue effects of reduced sales volumes. Also, benefits expected to accrue over the longer term, would have to be discounted back to present-day values before being compared with what are most likely to be current costs (in terms of forgone revenues). Unfortunately for such a strategy it is increasingly the case that, except in the short term, there are likely to be alternative potential suppliers of either the same mineral or a suitable substitute, thereby undermining Australia's market power in any particular mineral-based product.

With Australia generally accounting for less than 15 per cent of world production of any one mineral (see Figure 10.1 in Volume 3), there is little evidence to support any proposition that we are in a position to manipulate mineral markets to our advantage.

**Contract versus spot market sales can both make sense**

The short-term volatility of mineral commodity prices has already been remarked upon. Such 'spot market' prices fluctuate with unanticipated shocks to supply (eg strikes) and demand (eg unexpected variations in economic growth rates). Rather than rely totally on spot market sales, it can be in the interests of both mineral producers and consumers to enter into long-term contracts for agreed volumes and at agreed prices. Producers may be keen to enter into such contracts (even if prices are below those currently prevailing on the spot market) in order to guarantee mines
operate at close to their design capacities (where per unit operating costs are lowest). Similarly, customers may wish to enter into long-term contracts to secure consistent supplies in order to avoid inefficiencies which may be involved in having to regularly adapt production processes to new sources of raw materials supply.

Spot market purchases and sales can then be used by both buyers and sellers to adjust quantities for any unexpected hiccups in their plans. Such markets therefore reflect short-term influences on supply and demand, with prices acting to achieve a balance.

8.2 Does the imposition of export controls benefit the nation?

What export controls over minerals currently exist? What arguments have been advanced for government imposition of such controls? What costs do export controls impose? What action should government take on export controls?

What export controls over minerals currently exist?

The Australian constitution grants the Commonwealth Government power over international trade. Since the Australian mining sector is predominantly export-oriented, such controls - which enable the Commonwealth Government to intervene in the commercial negotiations of mineral exporting companies - have the potential to significantly affect the efficiency and development of these industries. Currently, the following export controls apply:

- Alumina, bauxite, coal, and iron ore exporters must obtain government approval on completion of negotiations;

- Uranium export contracts require the approval of the Minister for Primary Industries and Energy. Contract prices are required to be "fair and reasonable and in line with other prices prevailing in the particular market". Exports are permitted only to those countries with which Australia has a nuclear safeguards agreement;

- Export approval is required for nuclear material and equipment (including monazite, xenotime, nickel powder, and plutonium) to ensure they meet the requirements of the Government's nuclear non-proliferation undertakings; and

- Mineral sand exports (other than monazite and xenotime), are automatically approved, unless environmental reasons exist which the Government believes would make such exports undesirable.

What are the arguments for export controls?

Successive Australian Governments have retained export controls over selected minerals to allow them to intervene in mineral trade ‘in the national interest’. The arguments advanced can be broadly divided into ‘getting a better price’ for Australia's resources or serving some other objective(s) - such as conserving minerals for domestic use or preventing development on environmental grounds.
Arguments about getting a better price are hard to substantiate

It may be possible to use export controls to increase market prices under certain circumstances (eg by taking advantage of sole-supplier status or in near-monopoly situations which confer a degree of market power (see IAC 1988a, Appendix 9.2).

In particular, for Australia to enjoy significant market power in respect of an individual mineral we would have to control a substantial proportion of world production of (or at least dominate trade in) the mineral; there must be few (if any) substitutes for the mineral in question; and significant increases in production by others must not be a possible response if the strategy succeeds in raising prices prevailing on world markets. In the past, export markets for certain minerals were perceived by some to have these characteristics. However, as noted above, international mineral markets have tended to become progressively less dominated by supplies from any one country - so that it is highly unlikely that Australia possesses any market power in respect of particular minerals (if, indeed, she ever did).

Even if Australia was in a position to force prices for certain minerals up by restricting supplies, such a strategy may not result in increased revenues because reduced sales volumes may more than offset the revenue-increasing effects of higher prices. A further risk is that if overseas buyers can turn to alternative suppliers, they may not switch back to Australian suppliers if and when controls over export volumes are relaxed.

Possible problems associated with foreign ownership and transfer pricing have also been used to justify retention of export controls. For example, it has been argued that export controls allow the Commonwealth Government to monitor the transactions of entirely or largely foreign-owned companies, which may be trying to avoid Australian taxes by transferring minerals overseas at artificially low prices.

Whilst it was recognised by various participants, for example Alcoa of Australia Ltd (Alcoa, sub. 16, p.22) that the Government had an interest in ensuring that transactions between related companies are made at arms length, it was suggested that the Commissioner of Taxation already has powers over export contracts, since any producer's pricing policy is subject to scrutiny by the Australian Tax Office (Section 136 AD of the Income Tax Assessment Act allows the Commissioner to assess additional tax on income earned by a foreign-controlled interest from the supply of goods or services to an overseas purchaser on other than an arms-length basis).

Distorted buying practices are seen by some to exist between nations such as Australia and Japan, and are sometimes cited as another rationale for the imposition of export controls. For example, the reason given by the then Minister for Trade when price controls on mineral exports were reapplied in 1978 was that "... Australian companies face buyers who are co-ordinated or who have a high degree of consultation and who as a result can and do successfully play one seller off against another" (Australia, House of Representatives 1978, p.2187). More recently, the Minister for Primary Industries and Energy (1989a, p.81) stated that "distorted purchasing arrangements exist today which range from ... co-ordinated buying practices ... to various unfair tendering procedures which have become common internationally and act to concentrate bargaining power in the hands of overseas buyers". Thus one aim of export controls, given Australia's perceived weak bargaining position, has been to prevent suppliers competing among themselves.
The United Mineworkers Federation of Australia (UMFA, sub. 23, p.73) supported this view, contending that there would always be at least one company interested in expanding tonnage or securing other contract conditions in return for price concessions. This was seen to be detrimental since any low prices received would then apply to all exporters, thus worsening industry stability or viability.

No single producer is in a position to set the world price of coal, which fluctuates to equate overall levels of supply and demand. Australian producers should be allowed to act competitively in world markets.

Also, it has been argued (e.g. Alcoa sub. 16, p.22) that government possesses various other means of combating distorted purchasing arrangements - if they exist - without having to resort to export controls. As an example, Alcoa stated (Transcript p.722) that the Commissioner of Taxation now has the power to review contracts to ensure that the country is getting a "fair deal".

| In the Commission's view, there is insufficient evidence of distorted purchasing arrangements to justify use of export controls. |

Use of export controls has also been supported on grounds that the mineral industry may not have sufficient information about international minerals markets to make well-informed decisions - so that the underlying market conditions may not be accurately reflected in realised prices (Minister for Primary Industries and Energy 1989, p.81). For example, in late 1987 the Minister intervened to reject a series of steaming coal settlements with a number of North Asian industrial consumers, since it was believed that Australian sellers were dealing with imperfect information. Apparently, the Department of Primary Industries and Energy (DPIE) possessed information which indicated that the market had tightened demonstrably (Minister for Primary Industries and Energy 1989, p.81).

This perceived role assumes that government is more able to gauge the market than producers who operate in it on a daily basis. Unfortunately, there is no guarantee that pricing guidelines set by government will be appropriate, in the sense of accurately reflecting what the market will bear. For example, CRA Ltd (CRA, sub. 73, p.126) submitted that "successive Australian Governments have imposed a floor price on uranium exports which has effectively held prices for Australian uranium above the world market price. Until recently the policy has prevented Australia winning a larger market share."

| If government does possess superior market intelligence in the case of individual minerals, the Commission considers that it should simply disseminate the information freely to the industry, rather than intervene directly in the market. It would then be up to firms' commercial judgment to act on such knowledge. |

Notwithstanding this, participants questioned whether such cases would arise. For example, the Shell Company of Australia (Shell, sub. 66, p.8) suggested that markets for both coal and alumina are transparent to participants in these markets, and consequently Australian exporters were not seen to suffer due to any lack of information on the behaviour of these markets.
Other objectives of government are also used as justifications

Export controls have also been occasionally used to restrict (in part or completely) particular mineral developments. This has generally occurred in response to environmental concerns, to conserve specific minerals for domestic consumption or to meet international obligations.

Environmental and related considerations can also provide a rationale

Export controls have been used as a mechanism to control the extraction of certain minerals if a major environmental problem is seen to exist. If mine development hinges on access to export markets, the Commonwealth Government has the power to make mining uneconomic by imposing export controls. For example, the export of mineral sands extracted from Fraser Island was phased out in the mid 1970s, and exports were not permitted for mineral sands mined on Fraser Island after 31 December 1976. The imposition of this embargo was a reaction to the perceived conservation and environmental value of this island (a concern not, apparently, held by the Queensland Government at the time).

Many participants were opposed to use of export controls as an instrument for achieving specific environmental objectives. For example, the NSW Government (sub. 52, p.4 and p.74) argued that:

> Commonwealth intervention on environmental grounds in major export-oriented mining projects approved by state governments duplicates the states' functions, and is contrary to efforts by states to attract development ... it is preferable that the criteria for such restraints be developed in consultation with the states, or, at least, be clearly apparent before a development reaches an advanced stage.

In the Commission's view export controls are an indirect and inefficient way of addressing environmental concerns. Use of export controls to avoid adverse environmental impacts would fail, for example, if a project remains viable even if restricted to the domestic market. There is also clearly a need for better Commonwealth/State co-operation on such issues (see discussion in Section 6 and Attachment 7A of Volume 3).

Export controls have been placed on uranium for the purpose of meeting Australia's obligations under the Nuclear Non-Proliferation Treaty and Australia's bilateral safeguards agreements. (The uranium industry is discussed in Chapter 4.)

- Conserving minerals for domestic use is not a sustainable argument

In a number of cases the Commonwealth Government has imposed export controls on certain minerals in an attempt to ensure that supposedly scarce resources are conserved for domestic requirements. For example, in 1964 export controls on refined copper were introduced, and export embargoes were placed on copper and copper scrap to alleviate a domestic copper shortage, which had occurred partly because of the temporary closure of the Mount Isa smelter (IAC 1983, p.3).
However, by conserving certain minerals for domestic use, the Government can impose costs on suppliers, for example by forcing them to forego more profitable sales overseas. The possibility that export controls may be used may also adversely affect exploration efforts. For example, the imposition an embargo on iron ore exports from 1938 until 1960 greatly restricted the development of the Australian iron ore industry. More recently, the debate about sustainable development has resulted in calls to regulate the export of what are considered to be increasingly scarce resources. Section 8 of Volume 3 argues that sustainability concerns cannot be addressed at a local level and that attempting to ensure mineral sustainability in this country alone would be a mistaken policy.

Export controls should not be used to conserve minerals for domestic use, since they can impose costs on suppliers in terms of having to forego possibly more profitable overseas sales, as well as artificially reducing prices to domestic consumers - to the detriment of efficient resource allocation.

**What costs do export controls impose?**

If the Commonwealth Government concludes that there are advantages in intervening in Australian mineral markets by imposing export controls, it should only do so after taking into account the costs associated with such intervention (and logically should be able to recompense those suffering loss as a consequence and still be confident that the best interests of Australia had been served).

*Resource allocation effects will generally be adverse*

Export controls effectively eliminate the rationing device evident in a purely competitive market which allocates production amongst efficient producers. Consequently export controls tend to protect less competitive suppliers (including those in other countries, as in the case of uranium), with the costs being largely borne by more efficient exporters to whom volume and factors additional to price can be important. In the words of the Australian Coal Association (ACA, sub. 71, p.12):

> the allocation of Australia's total sustainable supply among individual producers should be determined by competition among them. Otherwise scarce national resources will fail to find their way into their most productive uses.

CRA argued (sub. 73, p.98) that in a situation of weak markets (where export controls are being used to try to stem falling prices) attention is focussed on price rather than other factors, especially volume, which may be of greater importance to an exporting company. Similarly, Shell submitted (sub. 66, p.12) that export controls were insensitive to declining markets, resulting in lost volume to competitive and more flexible overseas producers.
In this regard it is pertinent to note the Government's own stated rationale for the removal of export controls from a wide range of minerals in 1987 - that is, an attempt to "improve [Australia's] trade competitiveness" (Federal Minister for Resources 1987).

Delays are inevitable

Having to comply with the requirements of and bureaucratic procedures involved in applying export controls involves delays. In turn, delays impose costs on exporters since they are disadvantaged when negotiating new contracts, even when proposals are (eventually) approved - with no offsetting advantage in terms of prices obtained. Inherent delays built into the system can mean that Australian companies cannot adapt to changing market conditions as quickly as competitors are able to, and this can mean lost sales, especially on the spot market. Alcoa submitted that delays in approvals were unnecessary and tied up from "half to one person full-time to administer". As an example of the implications of such delays, the company pointed out (sub. 138, p.3) that:

In the mid 1980s, Alcoa wanted to sell 100 000 Mt [metric tonnes] of bagged alumina to China. [Alcoa] asked for urgent approval of a price which was $5 per Mt below the previous price, but still within the market range. The lower price was because [Alcoa] wanted to open a market [it] had not been in before. The urgent approval was also to organise shipping and bagging to meet the customer deadline. After two days [Alcoa] was told the price was too low by $10. Then seven days later they were told their original price was satisfactory.

As another example, time delays experienced by Shell (sub. 66, pp.15-6) between the submission of a proposal and final advice from the relevant Department(s), were on average seven weeks during the period September 1987 to December 1989 and three proposals "were in Canberra for almost four months each". The company pointed out that delays in obtaining approval can be longer than the time taken to negotiate the export contract.

Uncertainty is compounded

Intervention by governments can be interpreted as, or lead to, the general politicisation of trade. This aspect was raised by ACA when it submitted (sub. 71, p.14) that:

Export controls are more to do with politics than economics, with the government's preoccupation with year-to-year and month-to-month balance of payments results, and with union attempts to insulate the industry's workforce from market realities.

Uncertainty is created in the mind of the trading partner since political interests are inherently unstable, and therefore less predictable than commercial interests. This provides additional incentives for buyers to diversify their source of supply to an even greater extent than they normally would, as they attempt to reduce the perceived risks of supply instability. Such behaviour will result in losses of market share for Australia. According to the Australian Mining Industry Council (AMIC), buyers all over the world are "suspicious of the 'national interest' rules governing Australian coal sales" (The Australian, 27 March 1989, p.13). For example, Alcoa (sub. 138, p.2) claimed that:
In the mid 1980s, Billiton did a contract with Alumax for 100 000 Mt of Surinam alumina to be supplied over three years. Alumax, who is one of [Alcoa's] regular customers, told [Alcoa] that they made this purchase from Billiton ... because of Australian export controls.

The Commonwealth Government has stated that its export control powers are only exercised in exceptional circumstances when clear and compelling national interests exist (Minister for Primary Industries and Energy 1989, p.80). However, export controls still create uncertainty for the domestic mining sector even if controls are not strictly enforced, since the threat of enforcement still exists.

*Other costs are also incurred*

There are significant administrative costs associated with setting and monitoring export controls for both the Commonwealth Government and exporters. The Commission estimates, on the basis of information provided by DPIE, that it spends approximately $400 000 on wages annually to administer export controls.

**What action should the Government take on export controls?**

The efficacy of export controls comes down to whether the benefits outweigh the costs (where costs include those imposed on exporters as well as the costs of implementing the policy). Some costs, though real enough, would be very hard to quantify - for example the effects of controls on customer perceptions of the reliability of potential Australian suppliers (for which the occasions on which controls are actually exercised would be a poor proxy).

In the Commission's view, the arguments for imposing export controls are either redundant, spurious, or insufficient to justify their retention.

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<tr>
<th>Export controls distort efficient resource allocation and inhibit the economic performance of mining and minerals processing activities. They also impose costs through delays in gaining necessary approvals, the uncertainty they engender for trading partners, and the resources they tie up in setting, monitoring and enforcing the regulations.</th>
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The Commission recommends that existing export controls - except those in relation to the Nuclear Non-Proliferation Treaty and Australia's bilateral safeguards agreements - be abolished.

### 8.3 Should governments get directly involved in marketing minerals?

An issue which was debated by participants in this inquiry was the extent to which government authorities should get involved directly in the marketing function. This debate tended to focus on the coal industry, where some government intervention of this sort currently exists.
The Joint Coal Board (JCB) carries out a programme of trade development and export promotion, including the provision of technical, advisory and liaison services and the training of potential coal buyers from foreign countries.

Several participants objected to the JCB’s role in marketing. For example, Oakbridge Ltd contended (sub. 32, p.31) that the Board’s "orderly marketing" policies represented a form of intervention which is inappropriate in today’s coal markets, "and are pursued on such a conservative basis that market opportunities are likely to be forgone in favour of interstate and overseas competition." The New South Wales Coal Association (sub. 45, p.16) claimed that "the Board has increasingly moved into marketing in such a manner as to create a serious risk of being counter productive to companies' marketing efforts".

The JCB’s role in marketing did have its supporters. For example, the UMFA commented (sub. 29, p.6) that:

Companies often make commercial assessments that they can enter a market by excluding competitors. The aggregate of decisions such as this is industry crisis. ... the orderly marketing policies of the JCB are only perceived as too conservative because of the policies of many coal exporters which are based on tonnage expansion at the expense of other exporters by price cutting. The JCB requires some indication that capacity to be brought on stream will find a market without pushing other Australian exporters out or promoting heavy price cutting. This does not require firm contracts to have been arranged.

The UMFA went beyond support of the current JCB marketing functions to proposing establishment of a national body to reduce the level of disunity and competitiveness between coal exporters - since it believed that there would always be some exporting companies which have a material interest in entering into settlements which undermine the interests of the rest of the industry. It advocated (sub. 23, p.73) introduction of a national coal board "not to regulate from above or to act as a marketing body, but to participate actively on a day-to-day and informed basis and to play the role of an aid, a consultant and an agent of industry co-operation and planned development." The Federation proposed (sub. 23, pp.73-4) that the powers of this body should include the ability to operate a system of export controls and to undertake long-term planning of industry development (especially in relation to growth of excess capacity).

In rejecting the idea of a national body in any form, the ACA argued (sub. 142, p.5) that:

International commodity markets are strewn with failed attempts to maintain trade 'stabilising' bodies, better known as cartels, and Australia has had its fair share of examples. Of these, the recent experience of the Wool Corporation is instructive because, although the coal and wool industries are different in many respects, the UMFA proposal would at some stage require a coal price support/compulsory stockpiling scheme. To pretend otherwise is to profess perfect foresight of future coal demand and supply conditions.
The Commission recommends that governments and their agencies not get directly involved in marketing mineral products.

8.4 What effects do export duties have on international competitiveness?

What export duties are currently levied? What are the rationales behind their imposition? Are they equitable and/or efficient?

What export duties are currently levied?

The Commonwealth has the constitutional power to levy duties on exports. Currently two products under reference (high quality coking coal and uranium concentrate) are subject to export duties. In 1989-90, the Commonwealth received $57 million from the coal export duty and $4.4 million from the uranium export levy.

The coal export duty should be abolished

The coal export duty is payable on export coal - with the value of duty varying according to the quality of the coal. At present, the duty is $A3.50 per tonne and is charged on all export coal of 85 per cent or more carbon content from open cut mines of less than 60 metres depth opened before 1980. In practice, the duty applies to only six mines - all owned by BHP-Utah.

Rationale for duty

The stated rationale for the export duty on coal was to ensure that the "very large windfall profits ... being earned by the export sector of the coal industry [in mid 1975] should be channelled to the community" (Australia, House of Representatives 1975). Consequently, the duty was directed at mines earning high profits and the Government emphasised that the duty was not to be passed on through higher export prices. The present policy objective, recorded in recent second reading speeches, "is to make dutiable only high-quality coking coal destined for world steel industry markets. This coal attracts a price premium relative to steaming coal, which is exempt from export duty" (BHP, sub. 67, Attach.1, p.3).

Is the duty equitable?

The coal export duty is seen by some (eg BHP, sub. 67, Appendix 1, p.3) as breaching the principle of horizontal equity (ie the equal treatment of equals) because of its highly targeted nature in respect of coal production relative to other economic activities and, at an industry level, in respect of a group of mines relative to other Australian coal producers. BHP-Utah (sub. 67, Appendix 1, p.2) submitted that this duty "clearly contravenes" the Commonwealth Government's aim of providing a level playing field for industry" and "has become the most discriminatory tax imposed in Australia".

The UMFA argued (sub. 23, p.23) that the duty was uniformly applied according to coal qualities and mine parameters. The Federation did not therefore regard the duty as company regional specific.
The selective nature of the duty has allowed the Commonwealth to impose this revenue-raising measure on the export mines which it believes can bear the burden of the tax.

**Efficiency effects**

Changed circumstances since 1975 have meant that the tax has distorted production decisions. For example BHP-Utah submitted (sub. 67, Appendix 1, p.5) that in the past the coal export duty has induced undesirable coal production and marketing decisions or has precluded the realisation of market opportunities:

Many of those inefficiencies induced by the duty have been recognised and the legislation corrected. But other important, non-neutral, influences remain - most of them only capable of remedy by repeal of the duty ... In all cases the economic efficiency of mining operations has been reduced, their longer-term competitiveness has been eroded (however marginally), and Australia's export performance has been adversely affected.

In theory, the imposition of an export duty on coal will not create any adverse efficiency effects if the duty falls solely on surplus rents/windfall gains (see Appendix E of Volume 2). However, if this is not the case in practice the duty will be acting as a tax and causing inefficient decisions to be made (e.g. rendering uneconomic coal reserves which would otherwise be mined).

The debate surrounding the coal export duty therefore centres on whether it is acting as a tax on production, or is merely appropriating on behalf of the community rents which would otherwise accrue to BHP-Utah (in which case there would be no adverse efficiency effects). On the evidence presented the duty does appear to be affecting production decisions in the coal industry. In addition, as noted by the NSW Government (sub. 162, p.27), the unpredictable nature of the duty (and hence the presence of sovereign risk) may hinder long-term investment in the industry.

The Commission recommends that the export duty on coal be abolished (ideally in concert with reform of State Government royalty arrangements).

**The uranium export duty should also be abolished**

The *Customs Tariff (Uranium Concentrate Export Duty) Act 1980* imposes an export duty on uranium concentrate exported from the Alligator Rivers Region of the Northern Territory (the Region). The current rate of duty (operative from July 1989) is $1.30 per kilogram.

The duty was introduced in recognition of the costs incurred by the Commonwealth in relation to environmental monitoring of uranium mining in the Region (through financing the operations of the Office of the Supervising Scientist (OSS)). The duty is used as a mechanism to make the uranium industry, as far as practicable, pay the costs associated with protecting the environment, instead of the ordinary taxpayer (Australia, House of Representatives, 1989, p.253). (The operations of the OSS are discussed in Chapter 6, while Section 24 of Volume 3 contains a more detailed discussion of the uranium export duty and the OSS.)
Energy Resources of Australia Ltd (ERA) - the operator of the Ranger uranium mine objected to the levy (sub. 57, pp.24-6) because it considered that such an impost is discriminatory, accounts for a significant proportion of the company’s production costs, and represents an unfair burden on a company which has to compete in international markets. In addition, ERA claimed that it was effectively paying twice: once via the levy to support the operations of the OSS; but also a second time - since the company still has to conduct its own research to address environmental concerns associated with its operations (sub. 57, pp.28-9).

The Commission recommends that the uranium export duty be abolished (ideally in concert with the introduction of more appropriate charging for any environmental damage attributable to uranium mining).

8.5 Does the mining industry benefit from the availability of export assistance schemes?

The mineral industry, along with other Australian exporters, may benefit from services offered through The Australian Trade Commission (AUSTRADE). These include the Export Market Development Grants Scheme and the Export Finance and Insurance Corporation. State governments also provide some assistance, although this varies from state to state.

Most of the general export incentive schemes are aimed at smaller organisations and, as noted by AMIC (and reported in Section 10 of Volume 3), the mining industry is one of the lesser users of AUSTRADE. Removing benefits attributable to the efforts of AUSTRADE (and indeed other government-provided assistance to the mining industry) would likely have very little direct effect on the industry. But the same does not hold in respect of removal of assistance to other Australian industries, with the mining and to a lesser extent minerals processing industries likely to be significant beneficiaries of any such initiatives (see Appendix F of Volume 2).

Australian mining and minerals processing industries would lose little if existing assistance benefiting these activities (eg services provided, or schemes run by the Australian Trade Commission or State governments) were removed. But they stand to benefit a great deal if assistance presently provided to other economic activities (eg via tariffs on imports) were to be phased out.

8.6 What effects do trade barriers imposed by other countries have on the Australian mining industry?

As a major exporter of minerals and mineral-based products, protection afforded similar commodities in other nations, has the potential to significantly affect Australia's trade in mineral products. Non-tariff barriers to trade have proliferated in recent years, as countries have moved to protect domestic producers in the face of negotiated reductions in tariffs under GATT (the General Agreement on Tariffs and Trade). (Table 10A of Volume 3 summarises the main non-tariff measures affecting international trade in mineral products).
Participants identified a number of such barriers affecting Australian mining and minerals processing industries. For example, AMIC reported (sub. 29, pp.63-4) that market access restrictions affected a number of mineral commodities. Interventions on the part of other countries took a number of forms—such as subsidising domestic coal production and imposing tariffs on imports of semi-processed minerals. AMIC reckoned (sub. 29, p.63), that removal of coal subsidies in the Federal Republic of Germany (FRG) could result in an expansion in Australian coal exports of between 5 and 8 million tonnes annually (based on current world coal trade shares and an increase in FRG coal imports, allied to reductions in inefficient domestic production of between 25 and 40 million tonnes by the year 2000). The NSW Government (sub. 52, p.72) stated that although raw materials are generally granted duty-free access to developed countries, tariffs and other barriers to trade tend to increase with the degree of processing for many minerals. Tariffs imposed by the European Community and various Asian Countries were seen by Alcoa (sub. 16, p.21) as representing major barriers to trade.

Various non-tariff and tariff measures of protection maintained by other nations adversely affect Australia's exports of mineral products, since they penalize low-cost mineral producers attempting to build market share, interfere with the rational development of new suppliers and growth in trade, and create additional distortions and uncertainties in the international market for minerals.

**What should Australian governments do about international barriers to trade?**

Some participants, for example MIM Holdings Ltd (sub. 19, p.6) suggested that Australia should match protection in other countries to allow our export industries to compete on an equal footing. The Commission is opposed to a policy of ‘assistance-matching’ because of the economic costs such a course would impose on the nation as a whole. As expressed by ACA (sub. 71, p.12):

> The fact that foreign governments may intervene to protect their less-efficient producers from price competition does not justify similar practice in Australia. The international environment, however imperfect, must be taken as given. Policies which reduce efficient resource allocation within national boundaries will reduce a country's overall capacity to compete in that given environment.

Moreover, when a nation adopts a protectionist stance, its credibility suffers in international trade forums such as GATT, with consequences for the nation's ability to negotiate effectively.

The most effective way for Australia to make its sentiments known about protective measures used by others to assist domestic mining and processing and their consequences for low-cost producers is to use international forums to point out the costs of these protective measures to the subsidising nation. The magnitude of this problem has world-wide recognition, and the Australian Government has intensified its efforts to reduce these barriers bilaterally, as well as in the GATT Uruguay Round.
The Commission supports efforts by the Commonwealth Government to reduce barriers to international trade in minerals, both bilaterally and multilaterally.

8.7 How are Australia's mineral industries affected by relevant international commodity agreements?

There have been, and are, specific multilateral, bilateral, and general trade agreements affecting international trade in minerals.

Examples of specific multilateral agreements in which Australia has been, or is currently involved, include the International Lead and Zinc Study Group, the International Bauxite Association, the Association of Tin Producing Countries, the International Nickel Study Group, the Association of Iron Ore Exporting Countries, and the International Tin Agreement. Typically, the stated aims and functions of these agreements include: promotion of the industry (e.g., encouragement of consumption, export growth, and processing); safeguarding the interests of members and securing returns; providing an intergovernmental forum for the exchange of information (e.g., statistical information on production and consumption trends); and securing a balance between world production and consumption particular minerals (DPIE 1988, pp.14-24).

DPIE is responsible for several specialist consultative forums with other countries, including our principal trading partners and competitors. Examples include the High Level Groups on Energy with China, Japan, Korea, and Thailand, the Joint Committee on Mineral Resources Development with Korea, and the Working Group on Minerals with Canada. Also informal groupings and meetings occur from time to time on specific commodities.

What are the effects of these agreements?

Agreements vary considerably, ranging from those which are largely confined to research and development and/or information exchange and consultation activities through to those which attempt to regulate the market through measures such as quantitative export controls. In the latter cases, there is the real downside risk that at some stage signatories will be called upon to write very large cheques to ward off insolvency typically followed by a fundamental re-examination of whether such agreements really are in the interests of members of the cartel.

Some participants considered that certain of these agreements provided some benefit to the industry. For example, the bilateral bodies are perceived to promote better understanding of demand and supply developments and to encourage co-operative programs and/or technology exchange.

The Commission understands that multilateral commodity agreements are generally funded by the Commonwealth Government rather than industry. Where foreign policy considerations are an important motivation behind Australian membership (as has been suggested in the case of the International Bauxite Association), there are cogent arguments for government funding. In cases where clear benefits accrue to the mining industry, however, the case for industry funding is strong. However, the Commission acknowledges that the amounts typically involved are small relative to other forms of assistance, and that the administrative costs of collecting industry contributions could outweigh any net benefits.
9 CONCLUSIONS

This inquiry comes at a crucial time for the mining and minerals processing industries and, indeed, for the Australian economy as a whole. After receiving a great deal of material addressing key inquiry issues and as a result of its own research, the Commission is convinced that the potential of mineral resource based industries - in terms of the contribution they could make to the Australian economy - has yet to be realised. This is despite the fact that activities under reference already account for almost a tenth of gross domestic product, half of merchandise exports and commonly upwards of a fifth of annual investment spending. A major reason for this underperformance is that mining and early-stage mineral processing activities are hindered by numerous impediments. The Commonwealth and State/Territory and local governments are largely to blame for this sorry state of affairs, however well meaning and apparently justified the intent of their myriad interventions. But this conclusion should not be interpreted as merely pro-mining. Rather, the Commission would wish to see a situation emerge as quickly as possible in which mining and processing activities shoulder properly attributable costs - but only those costs. Stripping away unnecessary regulation and simplifying the remainder, combined with successfully addressing impediments in other parts of the economy which restrain mining, would dramatically improve the cost competitiveness of these industries. This would be partially offset by the imposition of any necessary additional costs associated with maintaining an acceptable environment. Importantly, acceptance of recommendations contained in this report should lead to more 'value adding' activity being undertaken in this country.

9.1 How effective are current government policies towards the mining and minerals processing industries?

An underlying thrust of this report is to address the issue of how Australia could sell more mineral resource based products, either as raw materials or in progressively more processed form - while at the same time containing adverse environmental effects associated with these activities within acceptable limits. Success in this endeavour would increase national income and thus the average material living standards of Australians. Or, to put it another way, how could Australia realise a 'clever country' status?

Current government policies toward mining and minerals processing are not 'clever'. It is not clever to erect a whole array of impediments to one of the few activities in which Australia enjoys a clear comparative advantage.

Preceding chapters have identified a range of government-inspired (as well as other) impediments to the efficient development and growth of activities located throughout the resource-based exploration/mining/processing/marketing chain. North Broken Hill Peko went as far as to suggest (sub. 33, p.2) that:
Government policy has created such a plethora of obstacles to success that the national standard of living is falling, just as the rate of discovery and commissioning of new mines is falling. These obstacles are so numerous that it may well be beyond the wit of a single person to identify and comment on even a majority of them, let alone them all.

In an industry where ‘windows of opportunity’ may open only occasionally, we choose to impose unnecessary delays by insisting that inefficient and cumbersome approval procedures be complied with and, in the case of some minerals, further require that government approval be obtained before export contracts can be entered into.

In an industry where risk and uncertainty are endemic, we compound these problems by:

- adopting policies which add to uncertainty through unclear and ill-defined procedures for approving projects; and
- increase risk by adding the wildcard of ‘sovereign risk’ whereby the demands of governments cannot be anticipated because they are continually changing.

MIM Holdings Ltd went as far as to claim (sub. 19, p.8) that:

Government action tends to target the possible outcome of the next election. The reality of our basic industries is that major investment decisions will influence results for 20 to 30 years - many terms of all Parliaments.

In a nation blessed by mineral wealth, we devote a lot of what otherwise could be productive effort to bickering over who will get what share of the mineral cake (unions, owners of capital, governments etc), rather than adopting policies which would increase its size. Pasminco Ltd suggested (sub. 89, p.33) that:

Australia is almost unique in that governments at all levels have chosen to absent themselves from any involvement in the sector and have instead treated the sector in a variety of ways but usually as something of a ‘milch cow’.

In an industry which must try to secure sales on increasingly competitive world markets, governments still intervene in an attempt to secure ‘better’ market outcomes.

In an industry which requires substantial amounts of capital, we impose foreign investment regulations on mining which are more restrictive than those applying to industry generally.

In a nation where there is clear potential for further processing of our mineral resources, we tolerate inefficient transport systems and inefficient supply of primary energy which can tip the scale against further value-adding here.

Taken together, interventions by governments in Australia represent a substantial impediment to the efficiency, international competitiveness, and further development of the industries under reference. In the words of Western Mining Corporation (sub. 69, p.4):
Overall, there is an absence of policy focus and consistency. Conflicts between policies exist and often there is a wide disparity between the objectives of a government policy, the means by which it is implemented, and the outcome which it achieves. Consequently, a specific policy may encourage exploration but another may discourage or delay development of any mine. Still other policies may influence the extent to which the mine product is processed or the marketing mechanism adopted.

9.2 What needs to be done and by whom?

Necessary reforms identified in this report include:

- introduction of procedures which allow objective assessments to be made of likely social costs and benefits when determining access to Crown land for exploration/mining and other purposes, thereby encouraging greater certainty and confidence in the decision-making processes of government;

- adoption of more efficient means of allocating and charging for exploration/mining rights;

- improved mechanisms for dealing with environmental effects of mining and related activities, to ensure that the industry shoulders its share of attributable costs (but only those costs) associated with maintaining an acceptable environment;

- reduction in and rationalisation of regulation applying to mining and minerals processing;

- modifications to a range of existing taxation arrangements which unnecessarily distort decision making, leading to an inefficient allocation of the nation’s resources;

- continued reductions in tariff (and other) assistance - particularly to non-mining activities;

- greater efficiency and increased competition in the provision of government-provided inputs such as transport and electricity;

- achievement of significant efficiency gains by subjecting transport services provided by rail and coastal shipping to increased competition;

- workplace-oriented labour market initiatives aimed at developing better relations between employers and employees in industries which have hitherto been characterised by often bitter confrontation; and

- reduced government interference in mineral trade.

While progress on these and the many other reforms advocated in this report will require action by all parties - including the industry, unions and community interest groups - governments must take the lead.
This should not be interpreted as advocating more government regulation of resource-based industries. Rather, the general direction of change should be towards governments vacating many areas of intervention, and restricting their role to the creation of an environment in which market-based processes can work more effectively. Thus, for example, in addressing the problem of overuse by the mining industry of services provided by the environment, greater consideration should be given to solutions which rely on market forces (eg transferable pollution permits), rather than approaches which involve the dead hand of government regulation.

The Commission recognises that it is the States which have primary jurisdiction over the development of the nation's mineral resources. Much of what needs to be done therefore needs to be done by State and Territory governments.

Reform in many areas will require co-operation and consultation between Commonwealth and State/Territory governments. The most obvious need for this is in the area of environmental management and regulation (others include transport, energy and taxation).

Although many issues addressed by this inquiry are interlinked (eg mechanisms for allocating and charging for mineral rights), so that securing the full benefits of reform may call for simultaneous change in several areas, the Commission stresses that substantial improvements could flow from adopting many individual recommendations contained in this report.

9.3 What are the most important areas for action?

Clearly, action is needed on a wide front. But which areas are critical and which may be considered relatively less important?

Whilst it is possible to estimate the likely benefits of removing some impediments (see below), others are less easy to put a figure on. For example, it is difficult to quantify the prospective benefits from improved decision making when it comes to resolving conflicts over access to land and land-use questions generally. Nor is quantification easy when it comes to environmental concerns. Yet such areas are clearly crucial to the efficient development of mining and minerals processing activities in this country.

In judging the relative importance of needed reforms, therefore, some degree of subjectivity is inevitable.

Some indication of the relative importance of individual issues/reforms can be gained by the emphasis given to them in submissions to the inquiry. On this score, issues associated with access to land and the interaction with mining and mineral processing with the environment stand out as central.

The Commission is inclined to agree that the most urgent requirement is for better mechanisms for resolving land-use conflicts, although reforming transport and energy and reducing industry assistance are also clearly crucial (with other areas of the economy likely to benefit from reform in these areas, along with with resource-based activities).
9.4 What is at stake?

The effects of removing some of the impediments to a more efficient mining and minerals processing sector have been quantified in Volume 2 of the report (see Appendix F of Volume 2). It is estimated that transport reforms focussed on rail, coastal and international shipping would increase gross domestic product by more than $5 billion annually. Certain reforms in the electricity supply industry are estimated to add another $2.5 billion to this figure, while removal of assistance to manufacturing activities and reduced assistance to the agricultural sector would add almost another $3 billion - taking potential total gains in aggregate economic activity to of the order of $10 billion annually.

While some of these impediments are by no means unique to the mining and minerals processing sector, the adverse impact on it is estimated to be greater than in other sectors of the economy. Because of its high export orientation roughly half of the estimated $10 billion annual gain in gross domestic product is attributable to an expanded mining and minerals processing sector.

While these (quantifiable) gains are clearly worth pursuing, the Commission considers that even greater benefits would result from implementing other reforms identified in the report - but which are less amenable to quantification.

Adoption of the Commission's recommendations (which are brought together in the Overview) would result in a much more efficient mining and minerals processing sector. This would lead to an increase in national income and hence material living standards, as well as a more congenial environment.
A1 TERMS OF REFERENCE & CONDUCT OF THE INQUIRY

The reference

On 18 October 1989, the Treasurer sent a reference to the Commission requiring it to inquire into and report by 28 February 1990 on mining and early-stage minerals processing industries in Australia (excluding petroleum and petroleum products). The Commission is to report on "any institutional, regulatory or other arrangements subject to influence by governments in Australia which lead to inefficient resource use, and advise on courses of action to reduce or remove such inefficiencies".

The terms of reference are set out on Attachment A1, while activities considered to be under reference are listed in Attachment A2.

Conduct of the inquiry

The Commission released a Background Paper in October 1989 setting out the main issues which at that time appeared central to the inquiry. The paper called for expressions of interest and submissions from those with an interest in the inquiry, and provided a tentative timetable for its conduct.

Visits and discussions

Following release of the Background Paper the Commission held meetings and discussions with a broad cross-section of groups likely to be affected by or have an interest in the inquiry. The aim of these discussions was to encourage maximum participation by those with a stake in the outcome of the inquiry, as well as to gain familiarity with the activities under reference and likely issues for the inquiry.

Discussions and visits took place in all States and Territories including at a variety of minesites (some located in remote areas). Included in the various discussions were representatives of a variety of mining interests (eg companies and unions), environmental and Aboriginal groups, and governments. A list of visits and discussions undertaken by the Commission is at Attachment A3.

Public hearings

The reference specified that the Commission was free to hold public hearings in advance of the release of a draft of its report. Due to the broad-ranging nature of the inquiry, the Commission decided to hold a preliminary round of hearings commencing in Perth in early April 1990 and continuing in various centres through till early May (see below).
Sixty four submissions were presented at the hearings and some 160 submissions were received by the Commission prior to publication of the Draft Report.

**Draft Report**

The Commission's Draft Report entitled Mining and minerals processing in Australia - was released on 28 September 1990. Following its release, the Commission received further submissions, taking the total number of submissions received by 31 January 1991 to 265. A list of submissions received as of that cutoff date is provided as Attachment A4, while a summary of views contained in those submissions is included as Appendix B of Volume 2.

Draft Report hearings were conducted around the country (see below), providing the opportunity for interested parties to comment on its content.
A1 TERMS OF REFERENCE

I, PAUL JOHN KEATING, in pursuance of Section 23 of the Industries Assistance Commission Act 1973 hereby:

(1) refer the mining industry (as defined by Division B of the Australian Standard Industry Classification), excluding petroleum and petroleum products, and minerals processing for inquiry and report by 28 February 1991

(2) specify that in respect of (1) above, the Commission's inquiry and report cover value added processing of minerals, including coal, to the unwrought refined metal and alloy stage or the equivalent stage of processing of coal and industrial minerals

(3) specify that the Commission report on any institutional, regulatory or other arrangements subject to influence by governments in Australia which lead to inefficient resource use, and advise on courses of action to reduce or remove such inefficiencies

(4) without limiting the generality of this reference, request that the Commission examine

(a) factors affecting minerals exploration and development, including allocation of mineral property rights and construction costs in remote sites

(b) operating costs such as energy, transport and labour costs (including on-costs) and the availability of these inputs

(c) other factors such as access to technology and the level of research and development which may be impeding the efficiency, international competitiveness and further development of Australia's mining and minerals processing industry

(5) specify that the Commission: (a) have regard to established social and environmental objectives of governments and ongoing processes, including before the Resource Assessment Commission, (b) consider the structure and efficiency of Commonwealth and State Government resource taxation and royalty arrangements, (c) and provide advice on the economic costs of different approaches to those objectives consistent with an appropriate return to the community for the exploitation of public resources

(6) specify that the Commission is free to hold public hearings in advance of releasing a draft report and to take evidence and make recommendations on any matters relevant to its inquiry under this reference.

P.J. KEATING

18 October 1989
### A2 ACTIVITIES COVERED BY THE REFERENCE

Following is a list of industries considered to be under reference, based on the Australian Standard Industrial Classification (ASIC) used by the ABS in compiling statistical information on the structure of the Australian economy.

**Division B: MINING**

<table>
<thead>
<tr>
<th>Subdivision</th>
<th>Group</th>
<th>Class</th>
<th>Industry</th>
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<td>METALLIC MINERALS</td>
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<td>1111</td>
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<td></td>
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<td>Silver-lead-zinc ores</td>
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<td>Tin ores</td>
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<td>OIL AND GAS (not under reference)</td>
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<td></td>
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<td></td>
<td>1501</td>
<td>Limestone</td>
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<td></td>
<td></td>
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<td></td>
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<td>Salt</td>
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### Division C: MANUFACTURING

#### 29 BASIC METAL PRODUCTS

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<thead>
<tr>
<th>Subdivision</th>
<th>Group</th>
<th>Class</th>
<th>Industry</th>
</tr>
</thead>
</table>
| 16          | 161   | 1611  | SERVICES TO MINING NEC<br>
|             |       |       | Mineral exploration (own account)\(^a\) |
|             |       | 1612  | Petroleum exploration (own account)<br>(not under reference) |
|             |       |       | Mineral exploration nec (own account) |
| 162         | 1620  |       | Mining and exploration services nec |

\(^{a}\) This group consists of establishments mainly engaged in exploration on their own account (ie not mainly on a fee or contract basis for other establishments).

\(^{b}\) A narrow interpretation of the reference would imply that these industry classes are not under reference.

Source: ABS 1985
## A3 VISITS AND DISCUSSIONS

<table>
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<th>Date</th>
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<td>Australian Conservation Foundation</td>
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<td>Alcoa of Australia</td>
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<td>Australian Council of Trade Unions</td>
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<td>BHP</td>
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<td>20/11/89</td>
<td>Olympic Dam</td>
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<td>AERIAL SURVEY</td>
<td>A survey made from an aircraft, such as photographic, magnetometer, radio-activity, etc.</td>
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<td>ASSAY</td>
<td>The testing of a sample of minerals or ore to determine the content of valuable minerals.</td>
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<td>ASSESSMENT LEASE</td>
<td>An optional interim step between an exploration licence and a mining lease.</td>
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<td>BASE METAL</td>
<td>A commercial metal such as copper, lead or zinc. The term was coined to describe a metal ‘inferior’ to precious metals such as gold and silver.</td>
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<td>BENEFICIATE</td>
<td>To treat ore so that the resulting product is richer or more concentrated with mineral. The term chiefly is applied to a preliminary mill treatment of bauxite and iron ore.</td>
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<td>BROWN FIELDS</td>
<td>Existing mining and mineral processing developments including those which are proceeding to operation (based upon expected conditions and government regulations at the time).</td>
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<td>CATCHMENT</td>
<td>The area bounded peripherally by a drainage divide and occupied by a river or stream and its tributaries.</td>
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<td>CLAIM</td>
<td>An area of land or water ‘claimed’ by a prospector or mining organisation for the purpose of exploring the claim for a certain length of time and subject to certain conditions. Claims are first staked out and then recorded in the appropriate state Department of Mines.</td>
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<td>CONCENTRATE</td>
<td>A product containing the valuable metal and from which most of the waste material in the ore has been eliminated.</td>
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<td>CRUSHING</td>
<td>Most ores are made up of hard, tough rock masses that must be crushed before valuable minerals can be released. Crushing and grinding of such ores for liberation before beneficiation is generally done in stages, with the possibility of some beneficiation between stages. Generalisation is difficult because each ore has individual characteristics that influence the crushing and grinding techniques which will be most suitable. The main task of primary-, secondary-, and in some cases tertiary-stage crushing is to prepare ore for fine grinding by either wet or dry methods.</td>
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<tr>
<td>CUT AND FILL</td>
<td>A method of mining where ore is removed and the resulting excavation filled with waste to support the stope before the next section is mined.</td>
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<td>CUTOFF GRADE</td>
<td>The lowest grade of ore used in the calculation of reserves.</td>
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</table>
DEVELOPMENT: Bringing a mining property to the production stage. Technically, the carrying out of works to gain access to the orebody.

ECONOMIC RESOURCES: This term implies that, at the time of determination, profitable extraction or production under defined investment assumptions has been established, analytically demonstrated or assumed with reasonable certainty.

ELECTRO-MAGNETIC SURVEY (EM): The most important of modern mineral-hunting techniques, this method is based on detection of electromagnetic radiation. The survey utilises varying degrees of conductivity between metals, basalt etc. EM equipment introduces electrical currents from above ground into the earth, and this electrical activity is measured during and after the currents have passed through rocks or mineral deposits.

EXISTENCE VALUE: The intrinsic value that is placed upon the knowledge that something occurs.

EXPLORATION: Exploration consists of the search for new ore occurrences or undiscovered oil or gas and/or appraisal intended to delineate or greatly extend the limits of known deposits of minerals or oil or gas reservoirs by geological, geophysical, geochemical, drilling and other methods.

EXPLORATION LICENCE: See Tenements.

FARM IN, FARM OUT: Descriptive of a joint venture or partnership in which an incoming (farm-in) partner earns an interest in a property by funding costs of exploration or providing expertise in the project, while the (farm-out) partner owning the property does not contribute.

FIRST COME FIRST SERVED: A method of allocating mineral rights (eg exploration licences) whereby the first applicant for those rights is assigned them.

FLOTATION: A wet mineral extraction process by which certain mineral particles are induced to become attached to bubbles and float, while others sink. Valuable minerals are thereby concentrated and separated from the worthless gangue. Flotation has become the most widely used process for extracting many minerals from their ores. It is based on the fact that the wettability of different minerals, upon treatment, are altered so that certain mineral particles remain unwetted and adhere to air bubbles. Through use of relatively small amounts of chemicals or oils, particle surfaces may be altered to an air-avid or water-avid condition - that is, the surfaces prefer either air or water. Thus, in a pulp of mineral particles and water through which air bubbles are passing, the air-avid particles attach themselves to the bubbles and are carried to the upper surface of the
pulp, where they enter the froth; the froth containing these particles can then be removed. The water-avid particles remain in the pulp. It is possible not only to float various minerals from gangue but also to separate certain valuable minerals from others selectively. Many complex ore mixtures formerly of little value have come to be among the principal sources of certain metals by careful application of flotation techniques.

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<tr>
<th>Glossary Term</th>
<th>Definition</th>
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<td>GEOCHEMICAL EXPLORATION:</td>
<td>An exploration method based on variations in the chemical composition of rocks or soil or sediments in stream beds.</td>
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<td>GEOLOGICAL SURVEY:</td>
<td>An exploratory program directed to examination of rock sediments obtained by boring or drilling or by inspection of surface outcroppings.</td>
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<td>GEOScientific Information:</td>
<td>Scientific information regarding the make-up of the land both at, and below the Earth's surface.</td>
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<td>GREENFIELDS:</td>
<td>Those mining and mineral processing developments that are not in existence or not preceeding to operation at a specified point in time.</td>
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<td>HEAVY MINERALS:</td>
<td>Usually accessory, detrital minerals of high specific gravity (normally greater than 2.85), which may be separated from lighter minerals by means of high density liquids.</td>
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<td>IDENTIFIED RESOURCES:</td>
<td>Specific bodies of mineral-bearing material whose location, quantity, and quality are known from specific measurements or estimated from geological evidence. Identified resources include economic and subeconomic components.</td>
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<td>IN-SITU:</td>
<td>A term used to describe rocks and minerals found in their original position of formation.</td>
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<td>INDUSTRIAL MINERALS:</td>
<td>Usually non-metallic minerals which are used in industry and manufacturing processes in their natural state, though generally with some beneficiation to imposed specifications; examples include asbestos, salt, gravels, building materials, talc and sands.</td>
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<td>JAROSITE:</td>
<td>An electrolytic zinc smelter waste iron product.</td>
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<td>LEACHATE:</td>
<td>The product after the dissolving of mineral or metals out of ore or rock.</td>
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<tr>
<td>LEACHING:</td>
<td>A chemical process used in milling for the extraction of valuable minerals from ore. Also, the natural process by which ground waters dissolve minerals, thus leaving the rock with a smaller proportion of some of the minerals than contained originally.</td>
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<tr>
<td>MARGINAL ORE/DEPOSITS:</td>
<td>Lower grade orebodies which are close to being uneconomic to mine.</td>
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<tr>
<td>MESA:</td>
<td>A level or nearly level mass of land that stands well above the surrounding country.</td>
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METALLURGY: The science of extracting metals from their ores, refining, purifying, and working them, mechanically or otherwise, to adapt them to use. It is also concerned with the chemical and physical properties of metals, their atomic and crystalline structure, the principles of combining them to form alloys, the means of improving or enhancing their properties for particular applications, and the relations between properties, structures, and uses. Further, it encompasses the thermal and mechanical processing of metals as materials of manufacture.

MILL: A plant, usually at the mine site, which concentrates ore or treats it so that minerals are separated and prepared for ultimate recovery in pure form. A mill's output of concentrates will be in less bulky form than mined ore. (Also a shortened term for a ball or rod mill.)

MINEABLE RESERVES: Reserves which are sufficiently extensive, continuous and accessible to allow them to be mined at a profit.

MINERAL: Solids formed by natural processes, minerals are generally crystalline and inorganic. The internal crystalline structure and the chemical composition are characteristic properties of each mineral, and they permit definitive characterisation and an understanding of the processes controlling the growth and subsequent history of minerals. Synthetic equivalents of some minerals are produced industrially (eg rubies and diamonds).

MINERAL (ECONOMIC) RENT: The excess of mineral revenue over all costs of production (including exploration and a 'normal' return on capital). Where all costs are not fully recognised the excess is known as quasi-rent.

MINERALISATION: In the sense of economic geology, the introduction of valuable elements into a rock body.

MINING: Mining, in a broad sense, is the excavation of valuable mineral materials from the Earth's crust including minerals of organic origin, such as coal and petroleum.

MULTIPLE LAND USE: The notion that a given area of land can accommodate several uses at the same time.

NATURALISED/ NATURALISING COMPANY: A company is granted naturalised status if: it is at least 51 per cent Australian owned; the majority of members of its board are Australian citizens; and the company, major shareholders and Government agree about voting powers in respect of the company's business in Australia. For a company to become a naturalising company it must: have a minimum 25 per cent Australian equity; majority of Board is Australian citizens; and public commitment is given to increase Australian equity to 51 per cent, subject to agreement between company, major shareholders and Government.
'ONE-STOP SHOPPING': Where one government agency is responsible for co-ordinating mining activity applications and approvals.

OPEN CUT MINE: A mine worked at the earth's surface.

ORE: A rock from which economic minerals may be obtained profitably.

OREBODY: A solid and fairly continuous mass of ore which may include low grade and waste as well as pay ore but is separate in form and character from the country rock.

ORE RESERVE: The tonnage of ore actually available for extraction, or in stock.

OVERBURDEN: Worthless unconsolidated surface material, such as earth, sand and boulders, covering the rock surface.

PEGGING: The act of establishing a claim over an area of land by hammering markers in the ground along the boundary of the claim at set intervals.

PILOT PLANT: Equipment set up on a small scale to duplicate a practical production plant: its purpose is to test a process prior to the commitment to build a full-scale plant.

PROBABLE RESERVES: Reserves where conditions are such that ore will probably be found but where its extent and limiting conditions cannot be as precisely defined as for proved reserves.

PROSPECT: A mining property, the value of which has not been proved by exploration.

PROVED OR PROVEN RESERVES: Those reserves which have been blocked out in three dimensions by excavations or drilling plus minor extensions beyond these.

QUARRYING: The process of obtaining stone from surface excavations, such rock material being produced either in regular blocks (dimension stone) by cutting methods or in variable-sized fragments (crushed stone) by blasting with explosives. Excavation of gravel is sometimes considered to be a form of quarrying, and both are types of open-pit, or surface, mining.

QUASI-RENT: See 'Mineral (Economic) Rent'

REAL-ESTATING: The action of making claims over large tracts of land with no intention of testing or exploring and hoping that an explorer will offer a higher price for the land even though no exploration has been done on the land.

RECOVERABLE RESERVES: That portion of reserves of minerals, oil and natural gas in places which are estimated to be capable of being produced.

REFINING: The final purification process of a metal or mineral.

REGIONAL RESERVE: Any specified Crown Land for the purpose of conserving any wildlife or the natural or historic features of that land while, at the same time, permitting the utilisation of the natural resources of that land.
RESERVES: Ore reserves fall into four general categories - proven, probable, possible and indicated. Proven is ore that has been blocked out on four sides; probably is ore that has been opened on two or three sides, while possible ore has been opened on one side only; indicated ore is ore that has been outlined by diamond drilling but which has not been opened by underground work.

RESOURCE: A concentration of naturally-occurring solid, liquid, or gaseous materials in or on the earth's crust and in such form that its economic extraction is presently or potentially (within a 20-25 year timeframe) feasible.

RETENTION TENEMENT/LEASE/LICENSE: Mining tenement that covers the development stage of a project between exploration and actually mining.

ROYALTY: Amounts of money paid by a company operating a mining property to the actual owner of the mineral rights to the property. The royalty may be based on so much per tonne produced or by a percentage of revenue or profits.

SEISMIC: A geophysical exploration method based on the measurement of wave fronts propagated by dynamite explosions. It helps determine the structure of sedimentary rocks.

SEISMIC LINES: Lines drawn on a map connecting points of the same seismic features.

SEQUENTIAL LAND USE: The notion that land can be first used for one purpose and then later used for another purpose.

SHAFT: An opening cut downward from the surface for transporting personnel, equipment, supplies, ore and waste. It is also used for ventilation and as an auxiliary exit. It is equipped with a surface hoist system which lowers and raises a cage in the shaft as well as 'skips' or containers for bringing up ore or waste. A shaft generally has more than one compartment.

SINTERING SMELTING: The action of a hot spring depositing a chemical sediment. The partial recovery of metal from processed ore. The latter will have been treated and concentrated at a mill, but smelting is required to actually recover the metal content and convert it to a form that is ready for refining.

SOVEREIGN RISK: The risk undertaken by developers that governments will subsequently change 'policy' from that which applied when investment decisions were first made.

STOPE: A space in an underground mine from which ore has been removed.
| **STERILISATION/STERILE RESERVES:** | Mineral reserves which may be economically viable but which are not permitted to be extracted. |
| **STRIP:** | To remove an overburden covering an orebody. |
| **SUBECONOMIC RESOURCES:** | This term refers to those resources which do not meet the criteria of economic, subeconomic resources include paramarginal and submarginal categories. |
| **SUBMARGINAL RESOURCES:** | That part of subeconomic resources that would require a substantially higher commodity price or some major cost-reducing advance in technology, to render them economic. |
| **TAILINGS:** | Material rejected from a mill after the recoverable valuable minerals have been extracted. |
| **TAILINGS DAM:** | A holding dam for tailings material. |
| **TENEMENTS:** | The general term used to describe large tracts of land granted to mining companies and prospectors by Australian State Governments for general 'grass roots' exploration. But the name and relevant conditions vary from State to State as each has its own Mining Act. |
| **WASTE:** | Material that is too low in grade to be of economic value. |
| **WORK PROGRAM BIDDING:** | Where exploration rights are awarded to the applicant with the preferred work program. |
| **RESERVES:** | Uranium Oxide - U3O8. |
| **ZONE:** | An area or region which is distinct from the surrounding rock either because of a difference in the type of structure of rocks, or because of mineralisation. |
Once upon a time, a mining company was wondering whether to build a new aluminium smelter. The manager started to read the latest IC report on mining to see if it contained anything which might help with this decision, but found that the whole report was quite incomprehensible, because it was full of obscure jargon about 'economic efficiency' - whatever that is.

So, instead, the manager called in the experts for a meeting to discuss the matter. The engineer said "This new smelter will produce twice as many tonnes of aluminium from the same amount of tonnes of alumina as the current smelter. It is obviously more efficient, so we should build it".

But the accountant said "Well, OK, it might be more technically efficient, but this new smelter will cost twice as much money to build as the current one." And the PR man chimed in with "It will also produce twice as much pollution as the existing smelter, and you know how long it's taken to build up our good image as a responsible corporate citizen." An inconclusive argument among the three ensued.

What is the manager to do? Well, fortunately, the marketplace law of survival of the fittest means that most people who get to the stage of running successful companies have at least a fair measure of plain, old fashioned, common sense.

The manager said "Well, let's think of all of these - our alumina, our cash, and our good name - as 'stocks' of company resources, which can be used as inputs to the production of aluminium. All we have to do then, is decide which smelter gives us the most value in aluminium from a given value of inputs. But how do we put a value on these resources? Well, our money in the bank is already measured for us in dollars, and rather than use tonnes as a measure for alumina inputs, we can use dollars for that too. Our good name is a bit harder to put a figure on, but from my years of business experience, I can put a rough dollar value on that also."

The manager then did his sums and discovered that the savings in alumina resources would be outweighed by the costs to the company's cash and good name. Although the new smelter is more technically efficient - as it has a better ratio of physical output to physical input - it is not more efficient economically, because it doesn't have a better ratio of value of output to value of inputs when all inputs are considered. On this common-sense basis, the manager decided not to build the new smelter.

After the meeting, the manager resumed reading the IC report, but still couldn't figure what this 'economic efficiency' stuff is all about. Consequently, the manager remains unaware that the decision was made exactly as an economist would say it should have been. And not having had the benefit of a classical education, our manager was also unaware that the word economist is simply a derivation of the Greek word for manager - oikonomos.
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