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COMMISSION**

**MINING AND MINERALS
PROCESSING IN AUSTRALIA**

**VOLUME 3:
ISSUES IN DETAIL**

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Volume 1 : Report (includes Overview)

Appendix A Terms of reference and conduct of the inquiry

Volume 2 : Commentary, statistics and analysis

Appendix B Views of participants

Appendix C Economic importance of resource-based industries

Appendix D Mineral exploration

Appendix E The economics of individual mining operations

Appendix F The costs of impediments to mining and minerals processing

Appendix G Brief history of government involvement in mining

Appendix H Assistance to mining and minerals processing industries

Volume 4 : Other supporting material

The Overview which appears at the front of Volume 1 is also available as a separate document.

ABBREVIATIONS AND ACRONYMS

States and Territories

NSW	New South Wales
Vic	Victoria
Qld	Queensland
SA	South Australia
WA	Western Australia
Tas	Tasmania
NT	Northern Territory
ACT	Australian Capital Territory

Companies/Organisations

AAEC	Australian Atomic Energy Commission
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACA	Australian Coal Association
ACF	Australian Conservation Foundation
ACIL	ACIL Australia Pty Ltd
ACMTC	Australian Coal Marketing and Technology Council
ACSA	Australian Collieries Staff Association
ACTU	Australian Council Of Trade Unions
AGPS	Australian Government Publishing Service
AHC	Australian Heritage Commission
Alcoa	Alcoa of Australia Ltd
ALP	Australian Labor Party
AMEC	Association of Mining and Exploration Companies
AMIC	Australian Mining Industry Council
AMMA	Australian Mines and Metals Association
AMPLA	Australian Mining and Petroleum Law Association Limited
ANPWS	Australian National Parks and Wildlife Service
ANSTO	Australian Nuclear Science and Technology Organisation
APEA	Australian Petroleum Exploration Association Ltd
ASSPA	(NT) Aboriginal Sacred Sites Protection Authority
ATSIC	Aboriginal and Torres Strait Islander Commission
AUSTRADE	Australian Trade Commission
BCA	Business Council of Australia
BIE	Bureau of Industry Economics
BMIC	Basic Metals Industry Council
BMMPIC	Basic Metals and Minerals Processing Industry Council
BMR	Bureau of Mineral Resources, Geology and Geophysics
CAI	Confederation of Australian Industry
CHJV	Coronation Hill Joint Venture
CIT	Coal Industry Tribunal
CLC	Central Land Council
CRA	CRA Ltd

CRL	Copper Refineries Ltd
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DASETT	Department of the Arts, Sport, the Environment, Tourism and Territories
DIR	Department of Industrial Relations
DME	(NT) Department of Mines and Energy
DPIE	Department of Primary Industries and Energy
EC	European Community
EFIC	Export Finance and Insurance Corporation
EPAC	Economic Planning and Advisory Council
ERA	Energy Resources of Australia Ltd
EXXON	EXXON Coal and Minerals Australia Limited
FIRB	Foreign Investment Review Board
GATT	General Agreement on Tariffs and Trade
IAC	Industries Assistance Commission
IBA	International Bauxite Association
IRC	Industrial Relations Commission
ISC	Inter-State Commission
IUCN	International Union for the Conservation of Nature and Natural Resources
JCB	Joint Coal Board
KCC	Kembla Coal & Coke Pty Ltd
LCA	Local Coal Authority
MIM	MIM Holdings Ltd
NATA	National Association of Testing Authorities Australia
NCA	National Coal Authority
NERDDC	National Energy Research, Development and Demonstration Council
NLC	Northern Land Council
North BH	North Broken Hill Peko
NSWCA	New South Wales Coal Association
OECD	Organisation for Economic Co-operation and Development
OSS	Office of the Supervising Scientist (for the Alligator Rivers Region)
PSA	Prices Surveillance Authority
QCB	Queensland Coal Board
RAC	Resource Assessment Commission
SRA	State Rail Authority (of NSW)
TLCWA	Trades and Labour Council of Western Australia
UMFA	United Mineworkers Federation of Australia
UNESCO	United Nations Educational Scientific and Cultural Organisation
WIRA	Waterfront Industry Reform Authority
WMC	Western Mining Corporation
WWF	Waterside Workers Federation

Other

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

PART 1

ACCESS TO LAND

ACCESS TO LAND

The following quotes from participants in this inquiry are representative of the wide range of views held on the question of access to land for the mining industry and land-use decisions generally, how such decisions should be made, and who should make them.

National parks and World Heritage areas have often been criticised by the mining industry as single land uses, and should not be set aside for conservation purposes alone. Although the prime function of these areas is nature conservation, they are not wholly restricted to that purpose. Many provide opportunities for recreation, education and science, along with secondary uses such as water catchment. These uses are seen by many as legitimate and important land uses. National parks and reserves also serve the environment by maintaining biological diversity, providing habitats for endangered species, and protecting important natural, historical and cultural features.

(Department of the Arts, Sport, the Environment Tourism and Territories, sub. 65, p.11)

... 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.

(Northern Land Council, sub.28, p.18)

... the farm is the farmers business and most often his life investment, as well as being the family's home and future. The farm represents a large investment in both time and money.

(The Landholders Association sub.8, p.4)

... without guaranteed access to land for mineral exploration purposes, on reasonable and practical terms, Australia's mining industry would begin to decline, to a point some years hence when as a viable industry it would cease to exist as an economic force.

(Association of Mining and Exploration Companies, sub.15, p.22)

With so much at stake for the mining industry and other affected by decisions relating to access to land for exploration and mining, it is vital that those made are the 'right' ones. This Part of the report looks at what governments can do in this area to help to ensure that both land and minerals resources are used in the most beneficial way for society as a whole.

1 ACCESS TO LAND - SOME GENERAL ISSUES

Judging by submissions to this inquiry, the issue of 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 the actions of governments, since most of the continent remains in Crown ownership (although much publicly owned land is leased to various categories of landholders - who usually have to be consulted about access). The Commission views the establishment of a well-defined and balanced regulatory regime governing access to land as being central to the efficiency, international competitiveness and further development of the mining and minerals processing industries and, indeed, the efficient use of Australia's total natural resource base. This section introduces general issues raised by the land-access question, and outlines the structure of the remainder of this part - which focuses on specific land-use conflicts relevant to this inquiry.

1.1 The general nature of the problem

Mineral resources generally lie scattered on - or more likely below - the surface of the land. Who owns these resources? On what basis can potential explorers/miners gain access to them? Does the existing legal framework in Australia specify these rights of ownership and access in a way which encourages them to be used (or left alone) in the nation's best interests? Do existing arrangements for allocating and charging for exploration and mining rights ensure that any gains from developing mineral resources are shared equitably with the community? Such questions are clearly fundamental to the efficiency and growth of the mining and minerals processing industries in Australia.

Important though these questions are, they are only a part of a broader set of questions relating to the effective use of society's scarce resources. Because developing minerals requires access to the land on the surface, questions of access to mineral resources are inevitably tied to questions of land use. Exploration for or exploitation of minerals lying below the surface is only one of several possible uses for a given area of land. Others include conservation, Aboriginal heritage, recreation, farming, forestry, urban settlement and so on. Sometimes these uses will be mutually exclusive, but more often some combination of uses will be possible (multiple land use). Moreover, it may be possible for alternative use(s) to be made of the same tract of land over time (sequential land use). An important question then is whether the existing institutional framework defines rights of ownership and access to the community's total resource base - including both surface land and minerals - in a way which maximises their total value - both economically and otherwise - to the community.

The question becomes one of how the rights of those with an interest in the land surface are to be reconciled with the rights of those with an interest in the minerals which may lie below the surface. How should potential conflicts be resolved? In more recent times, these questions have received increasing prominence in line with growing community concern for the environment and increasing discussion of concepts such as 'sustainable development' and 'multiple land use'.

1.2 The current debate

Unfortunately, existing institutional arrangements do not appear to be providing an effective and efficient means of resolving land-use disputes - which have tended to escalate in recent times. Drawn-out disputes characterised by claim and counter-claim, grandstanding and misinformation, emotion, bitterness and even violence stand as testament to this failure. The mining industry has become a focus of these battles: miner versus conservationist; miner versus farmer; miner versus urban resident; miner versus Aborigines (or their representatives). Boxes 1.1, 1.2, and 1.3 illustrate some differing views taken on these issues.

Box 1.1: Access to land: the mining industry viewpoint

... since the late 1960s the industry has witnessed a steady encroachment over vacant Crown land and leasehold, particularly for the purposes of creating new conservation areas and for the allocation of land to Aborigines. With exploration and mining effectively prohibited in national parks and conservation reserves, and with the granting of the right to Aboriginal landowners to veto exploration or mining access, the industry now faces a situation where over 20 per cent of the Australian land mass is effectively sterilised from exploration or mining. If private agricultural land in Western Australia (where there is also landowner veto), forestry reserves and defence land are added, the total area subject to sterilisation or varying degrees of restrictive access amounts to 26 per cent of Australia's land mass. In the late 1960s such restrictions applied to approximately 7 per cent of Australia.

Source: Australian Mining Industry Council (AMIC, sub. 29, pp.34-5)

Box 1.2: Access to land: an environmentalist viewpoint

In Australia less than 5 per cent of our landmass is dedicated as national park or reserves ... The [mining] industry argues that one of its greatest problems is diminishing access to land for exploration and mining (Strong 1985). If this is so, and the industry is dependent for its survival on access to a mere 5 per cent of our land mass, then how long will the industry last? If 95 per cent is not good enough, then we must seriously consider whether the industry is viable at all! Of course, the mining industry argues that other areas of Australia are denied to them. In 1988, and again only a week ago, the Australian Mining Industry Council stated that 23.5 per cent of Australia's land surface and nearly 50 per cent of the NT, mostly consisting of Aboriginal land and conservation areas, were either "severely restricted or closed" to new exploration or mining activity. Even if this were [the case], it would offer no justification for the exploitation of our national parks and nature reserves. The truth is that the mining industry's claims are wildly exaggerated ...

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

Box 1.3: Access to land: a government department viewpoint

It should not be assumed that the mining industry has the right, either moral or legal, to explore or have access to every piece of land on the Australian continent and surrounding oceans. The Australian Mining Industry Council have claimed that "more than 23 per cent of the land surface of Australia is either severely restricted or closed to new exploration or mining activity." Despite some contentions regarding the complete accuracy of this figure, it appears mining activities are restricted in some areas of Australia. These areas include Aboriginal lands, conservation and Heritage areas, some private land, urban and other Commonwealth-owned land - all of which have important primary uses which must be considered along with possible mineral potential. Despite AMIC's claim that restrictions in land access is a "problem", these restrictions have been placed to protect areas assessed as having land uses 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.

Source: Department of the Arts, Sport, the Environment, Tourism & Territories (DASETT, sub. 65, p.12)

The Commission does not intend here to take sides or act as referee on specific current or past conflicts. Rather, in highlighting some of the problems the Commission hopes to advance a debate which too often in the past has been based on emotion and propaganda rather than rational analysis and debate. From the Commission's viewpoint, percentage figures on the amount of land available for mining or reserved as national parks and the claims made about them are of little significance in themselves. Of more importance is whether, to use DASETT's terminology, land-use decisions allow for competing values to be genuinely assessed. Only if the relative values of different land-use options are carefully weighed on an ongoing basis - either in the marketplace or by other means - will the community's resources be allocated to the uses which maximise national welfare. In making such assessments, two questions inevitably arise regardless of the type or ownership of the land. What is access required for, and for how long will it be required?

1.3 Access for what?

An important general issue is whether the rules regarding access to land should differ for exploration as opposed to mining. Many participants in this inquiry stressed the need to distinguish between access to land for exploration and access for mining. In particular, it was argued by some that exploration has much less environmental impact than mining, moves quickly from large tracts of land to narrow areas of prospectivity, and is primarily an information-gathering activity without which rational decisions on resource use cannot be made.

1.4 Access for how long?

Assessments of the relative values of alternative land uses will also vary considerably depending on the time frame. Adopting too short a time frame may result, for example, in important long-term environmental damage arising from a mining project being omitted from the weighing of potential costs and benefits, thus risking inappropriate land-use decisions being made. On the other hand, sub-optimal decisions may be made if the potential for land to be rehabilitated - and maybe devoted to even to more valuable uses than was the case before mining - is ignored.

1.5 Structure of Part I

Following this introduction to the general issues associated with access to land for the mining industry, the remaining sections in Part I (ie Sections 2 through 6) look at various issues associated with two main aspects of the land-access question. One is the general issue of allocating land between alternative uses (including exploration and mining). A second level of issues is concerned with allocating mineral rights between individual explorers or miners (ie once these have been determined as the most suitable land use). Of course in practice this distinction is blurred and these property rights issues are intertwined both in concept and time.

Section 2 describes the Australian system of Crown ownership of minerals and how governments provide for the development of these resources on behalf of the community. This system is compared to some alternatives (eg private mineral rights) in terms of both efficiency and equity, drawing on a discussion of the importance of property rights in Attachment 2A.

Section 3 then examines a number of different means of allocating mineral rights to private developers and suggests how existing methods could be improved. Included in this analysis is an investigation of whether government should be involved in exploration activity (Attachment 3A).

Following sections then look at specific land-use conflicts which have arisen in the context of the mining industry and examines possible means of their resolution. An important part of this analysis is the extent to which market-based mechanisms need to be supplemented by government intervention in order that a proper assessment of relative values of different land uses can be made. The first issue examined (in Section 4) is Aboriginal property rights - an issue which raises particularly difficult economic, social and moral questions. Section 5 focuses on the rights of other private rural and urban landholders. Conflicts between mining and other public uses for land such as conservation and heritage preservation where the interests of more than one individual or group within society are likely to be involved is the subject of Section 6. The question of exploration and mining in national parks, and National Estate and World Heritage listings receive separate treatment in Attachments 6A, 6B, and 6C respectively.

2 OWNERSHIP OF MINERALS

Crown ownership of minerals - which forms the basis of the regime under which minerals are exploited in Australia - is rarely questioned. However, 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 is warranted. Such an examination suggests that systems involving private ownership of minerals offer certain advantages over Crown ownership, but also involve disadvantages. While the Commission accepts that a general departure from Crown ownership of minerals is not justified at present, there is considerable scope for improving the current system.

The system of ownership of resources has a fundamental effect on the efficiency with which they are used, as well as the distribution of the returns from their use (see Attachment 2A). The purpose of this section is to describe and critically examine the fundamental features of the Australian system of mineral ownership. Does this system promote the efficient use of Australia's mineral resources and also provide for "an appropriate return to the community for the exploitation of public resources"?

The first part of this section outlines the main features of the Australian system of Crown ownership of minerals, including the division of powers between levels of government in Australia and how these rights are exercised to allow for the development of mineral resources. The relative merits of this system are then compared with those of alternative systems.

2.1 The Australian system: public ownership

In Australia ownership of mineral resources generally lies with the Crown (in practice State/Territory and Commonwealth governments), regardless of who owns the land on the surface. This seems to reflect a widely held belief that mineral deposits are a fortuitous 'gift 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.

For completeness, it should be recognised that there are some isolated exceptions to public ownership of mineral resources. In NSW, Aboriginal Land Councils have been granted title over minerals (with the important exceptions of gold, silver, coal, and petroleum) on their land. In addition a few mining leases granted before 1899 (eg the Hampton Plains Estate in the Coolgardie - Kalgoorlie region of Western Australia), are still operational, and provide for private ownership of minerals except for the 'royal' minerals of gold and silver. This reflects the fact that in the early years of settlement, British common law applied - '*Cujus est solum ejus est usque as coleum, et ad inferos*' (whosoever has the soil, also owns to the heavens above and to the centre beneath). Thus under common law, all minerals (except for gold and silver) belonged to the landowner. Governments in Australia have gradually reversed the common law position by progressively adopting a practice of reserving minerals from land grants - this now applies to all minerals. In addition, most States have legislated to resume privately held rights to minerals remaining from early land grants.

The Australian pattern of public ownership of mineral resources and separation of mineral rights from surface land rights is not a universal one. For example, significant private ownership of minerals occurs in other countries such as the USA, the UK, Canada and South Africa.

Constitutional division of powers

An important feature of the Australian system of Crown ownership is that the national level of government is not the principal holder of mineral rights. Since mining is not explicitly mentioned in the Australian Constitution, ownership of minerals found onshore or offshore within the three (nautical) mile territorial limit defaults to the relevant State/Territory government. Minerals found beyond the three mile limit or in external territories are the property of the Commonwealth. This division is one which evolved historically rather than one based on underlying principles of equity (are citizens of a resource-rich State any more deserving than those of less well-endowed States?).

There are exceptions, however, to this general division of property rights between the State and Commonwealth Governments. The most important of these occurs in the Northern Territory where the Commonwealth Government retained property rights over uranium and other substances prescribed in the *Atomic Energy Act 1953*, following the granting of self-government to the Territory.

Other aspects of the Australian Constitution also serve to blur the division of mineral rights between the State/Territory and Commonwealth levels of government. Commonwealth power over matters such as international trade, taxation, defence, people of any race, and external affairs (including World Heritage listings etc) can be exercised in some cases to severely restrict the rights of the various State/Territory governments to use as they see fit the resources over which they have claim. For example, the rights of the Queensland Government to use the resources it owns on Fraser Island were constrained by the Commonwealth Government's imposition of export controls over mineral sand products. Several participants (eg the Trades and Labour Council of Western Australia sub. 39, p.33) noted that in recent times the Commonwealth has increased its involvement in resource development via such indirect means.

How do States/Territories exercise their mineral rights?

The above qualifications aside, it is generally State/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 the right to do so on others. Typically, these rights are not transferred outright; rather, temporary ownership is effected via the granting to private - sector interests of exploration and mining leases for specified periods.

What are the broad features of this system?

Leases granted by State/Territory governments normally impose various conditions on the leaseholder which define the rights to exploit the resource. As discussed in more detail later (see Sections 3 and 12), the conditions which are imposed on the holder of a right to explore and/or mine can have a significant impact on the efficiency with which mineral resources are discovered and developed.

In most States and in the NT exploration licences are granted on the basis of 'first come first served'. Conversion of a right to explore into a right to mine generally requires the satisfaction of a number of additional conditions. The holder of a right to explore is normally given first option over mining rights. The efficiency and equity effects of these types of allocation systems on the development of mining and minerals processing industries in Australia is discussed in Section 3.

In return for the transfer of (conditional) property rights to private interests, it is generally (but not universally) accepted that governments, on behalf of the communities they represent, should be compensated. Since governments in Australia typically allocate exploration and mining rights on a non-price basis, full payment (in the sense of what these rights are worth) is generally not received at the time of their allocation. In these circumstances, there is a need to devise other measures aimed at recouping an appropriate share of the value of the resources transferred to private hands on behalf of the community at large. Royalties, resource rent taxes and related payments represent instruments designed to ensure that the community is compensated for the exploitation of publicly owned assets. The notion that the community should receive a 'fair' return for the use of its resources also appears to be one important rationale underlying a range of other interventions by government in the industry (eg export controls and duties and excess government charges for rail services). The imposition of these additional measures would seem to imply that existing royalty schemes are considered deficient. Royalties and related issues are discussed in Section 14 of Part IV.

Obviously, it is no good having the rights to exploit mineral deposits if one cannot get to them - that is, without some right of access to the land above a mineral deposit. If the owner of the resource is also the owner of the land (eg the relevant State, Territory or Commonwealth Government) negotiations for access to land and minerals can be handled simultaneously. Things become more complicated, however, where surface and sub-surface rights are held separately. How are potential conflicts between the rights of these parties handled?

Part III of this volume spells out in more detail the procedures which potential explorers or developers of mineral resources are required to follow in order to gain access to land. While the legal framework differs somewhat among the various jurisdictions some generalisations can be made. Where a potential developer desires access to unoccupied Crown land, the main considerations in determining whether or not an exploration or mining lease will be granted relate to the existence of conflicting public uses of the land, such as for forestry or national parks. In the case of occupied Crown land or private land, a mining lease (or tenement) may be granted provided that agreement has been reached between the miner and the current occupier for compensation for any damage caused by the mining operation. 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 development on their property. Of most practical relevance are exemptions often accorded to owners of cultivated or otherwise improved land; and special consent procedures in relation to aboriginal land in the Northern Territory spelt out in the *Aboriginal Land Rights (Northern Territory) Act 1976*.

2.2 Alternative mineral regimes compared

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

- . the 'regalian' system where the state owns any minerals but leases rights to exploit these resources to private firms under set conditions;
- . a system whereby state ownership of minerals is inalienable and where resources are developed either directly by a state-owned authority or by a private firms under contract; and
- . a system where mineral ownership is tied to ownership of the land above.

In most countries one or other of these regimes predominates but often some combination of these systems is employed. 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 minerals owned by private landholders (eg in Tasmania). In the USA, sub-surface and surface rights are linked so that 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).

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

In evaluating this question both equity (are the benefits shared fairly?) and efficiency (are the total benefits maximised?) criteria should be considered.

The case for Crown ownership

Equity rationale: securing a 'fair' return on publicly owned resources

Very few participants questioned the fundamental feature of the Australian system - Crown ownership of minerals. General acceptance of Crown ownership seemed to rest largely on notions that minerals were properly the property of the community at large. 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." CRA Ltd, for example, quoted Ministers Kerin and Cook:

... the Labor Government holds to the principle that natural resources belong to the Australian community. The exploitation then of these resources by private concerns must generate an appropriate return to the Australian people.

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.

Several participants proposed that all remaining private mineral rights should be resumed by State Governments. For example, Stockdale Prospecting Ltd considered (sub. 43, p.2) that:

... the State governments should take positive action to resume ownership of all minerals in those few areas where they are owned by the landholders, perhaps using the successful South Australian legislation as a model.

Under the South Australian arrangements, a person divested of property in mineral rights could, within a three year period of their resumption, apply to have their land declared a 'Private Mine' if they had conducted mining operations during the previous 12 months. This entitled them to the right to determine who enters land for exploration and mining and to receive royalties. Provision also exists for persons divested of property in minerals to apply for a royalty if a mine is developed on land on which minerals were formally alienated.

But why are minerals different?

Although the above propositions seem quite reasonable at face value, some interesting questions can be raised. Why are minerals different to other natural resources - land, for example, which could also be viewed as 'a gift of nature' and which the Crown has been quite prepared to sell outright to others? One answer might be that land is more easily valued than minerals which may or may not be present under that land. An outright sale may therefore return to the government only a small proportion of the value of the resources actually transferred to private hands. The fact that minerals tend to be seen as particularly valuable and important in terms of revenue flow also seems important in reinforcing the notion that government should retain close control over their exploitation.

Does Crown ownership guarantee a 'fair' return?

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 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 on behalf of the people they represent - making them poor agents when judged 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 suggests that governments may well collect only a fraction of available mineral rents, in the process causing inefficient production decision to be made (because they typically adopt sub-optimal royalty schemes in their efforts to secure a return for the community).

In the case of governments with a 'pro-mining' stance, the ability to obtain a 'fair' return under Crown ownership must be in doubt, because governments of different States and Territories compete against each other for development. In the USA, where there is both public and private ownership of mineral rights, it has been claimed that:

The United States government ... is a most profligate and careless landlord. Royalties and rentals in the private market are much higher than those imposed for federal resources. A special commission reported in 1982 that the government loses "hundreds of millions of dollars" in oil and gas royalties annually. (Mayer and Riley 1985, p.3)

The Australian Conservation Foundation (ACF, sub. 68, p.21) contended that in some cases the return to the owners of minerals (the public) has been less than satisfactory. In respect of Tasmania, for example, it noted that one report indicated 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.

The ACF commented (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."

Submissions to this inquiry from the mining industry generally strongly supported continuation of Crown ownership of Australia's mineral resources. Yet in other areas of economic activity, notably transport and energy, equally strong support was given to deregulation and commercialisation on the grounds that governments were not generally noted for their ability to run businesses (eg manage the assets of government business enterprises). A typical view was that of CRA which stated (sub. 73, p.29) that:

Crown ownership of minerals is not disputed by CRA. Indeed the system we have in Australia has probably been partly responsible for the growth of the minerals industry this century (although this could be at risk as a result of the passing of mineral rights to some Aboriginal peoples via the veto system). 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 ...

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

Why might this be the case? One reason may be that governments tend to have a broader range of objectives than maximising the present value of the resources they own. Hunt (1988) for example, notes that mineral policy objectives reflect the interplay of four groups: the landowner, the owner of the minerals, the miner and the State; and observes that:

The State has an interest in each of these four contending groups and is the adjudicator between them. As landowner, it holds areas of Crown land as parks, reserves, forests and other lands for public purposes as well as areas of vacant Crown land. As owner of the minerals, it will receive royalties. It will receive other income and 'socio-economic' advantages as a result of the mineral development and sometimes itself as a miner. Moreover, the State is the custodian of the public interest in the wide sense of protecting the environment and minority groups such as Aborigines. Further, the State must establish and administer the legislation by which the contending interests of these four classes can be regulated. The potential for conflict of interest on the part of the State is enormous.

Historical rationales for Crown ownership

Although equity is the usual reason given, an examination of the historical development of mineral laws suggests that other rationales may have been more important. Moreover, original rationales may no longer be justifiable. The Victorian Farmers Federation (VFF, sub. 84, p.7) submitted that:

The original minerals owned by the Crown were gold and silver. Ownership of these minerals was justified when the quantity of precious metals held directly impacted on the economic position of one country in relation to another ... Gold and silver were at one time the basis of exchange, however, close ties between gold and domestic monetary systems of various nations were severed long ago ... The VFF submits that the indirect contribution gold and silver and other minerals make to the economy are no different to the contribution that all other commodities make. As the historical role of precious metals has changed, it is no longer logical that the Crown should retain ownership of minerals.

Ackroyd (1988) notes that the claim of the Crown to a prerogative right to gold and silver arose from the English Case of Mines in 1567 which was argued on the grounds of excellency (the most excellent products of the soil should go to the most excellent person in the realm), necessity (the King needed money to raise an army and enforce laws while treasures of gold and silver held by subjects would enable them to raise up forces against the Crown), and convenience (gold was necessary for coin of commerce and only the Crown could mint). It is hard to see the relevance of the royal prerogative to modern resource management. On the other hand, Barton (1989) suggests that it is a fallacy to imply that if the old reasons are gone there are therefore no current ones and that "many currently useful institutions came into existence for very odd reasons." Moreover, Barton claims that severance of mineral title from land title has in fact occurred at all stages of English history, and predates the Case of Mine by some centuries.

Efficiency arguments for Crown ownership

In addition to arguments based on equity or "securing a fair return on community resources", many participants argued that Crown ownership has improved economic efficiency by encouraging

mining. For example, the Australian Mining Industry Council (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." Certainly, State government policies have traditionally given pre-eminence to mining as a land use.

It should be remembered, however, that enhancement of mining is not - as often assumed by the mining industry - necessarily efficient from society's point of view. It is possible, for example, that the system of rights established through Crown ownership has led to mining taking place on some land at a time and manner which - taking into account all costs and benefits (eg costs of environmental damage) - society would have been better off had that land remained (at least for some period) in an alternative use (such as agriculture or conservation).

An important question, then, is whether Crown ownership has led to an 'over-expansion' of mining relative to other industries because of favoured treatment. 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 Section 3). Mechanisms (eg royalties) for securing a fair return for the community in return for transferring to others the right to exploit publicly owned non-renewable resources may also lead to inefficiencies - by distorting production decisions (see Section 14 and Appendix E of Volume 2). 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. Indeed, Western Mining Corporation was motivated to comment (WMC, sub. 69, p.31) that:

... we are too concerned with the way in which the cake is divided or how, in theory, it might be better divided, rather than working to make the cake bigger.

In addition, conditions attaching to leases may cause quite different decisions to be made to those which would otherwise have been made if purely economic considerations prevailed. Section 12 discusses the effects of imposing terms and conditions of exploration/mining leases granted by State governments.

Constitutional division of powers

The Constitutional division of powers, particularly the taxing power of the Commonwealth and the vesting of mineral rights with the States has the potential to undermine the ability of Crown ownership to efficiently develop minerals and to secure a fair return to the community.

Pasminco considered that the administration of royalties by the States was not desirable in the national interest. They said (sub. 89, p.73) that:

... Constitutional constraints are such that the Commonwealth appears to have very few powers (if any) over the States' rights to collect royalty and the States are not motivated necessarily by national well being. In other words it is difficult to see the national interest being best served whilst the states so effectively 'cream off' the mining dollar having State

objectives in mind rather than national objectives. This position is to be regarded with concern because the mining sectors contributes substantially to national well being through the export sector and yet mining efficiencies are reduced by the actions of the states who do not have to be concerned to the same degree with such efficiencies or the national interest.

Emerson and Lloyd (1983) note that:

If the taxing authorities of a State and the Commonwealth, or perhaps of two different States vying for a mineral project, endeavour to maximise their individual government interests, the outcome will inevitably be a distinctly sub-optimal structure of multiple taxes. Multiple taxes collect less revenue because they distort production, and in some instances competition among States has lowered rates of taxation. Currently the State and Commonwealth governments are acting in this way. Such an outcome is inexcusable folly for the nation. The States and the Commonwealth should suppress their individual interests when determining the tax structure and squabble only over the distribution of the proceeds.

These quotes highlight some of the problems caused by the separation of ownership of mineral resources (and hence the right to charge for their transfer to private hands) and responsibility for community welfare. In the words of North Broken Hill Peko (North BH, sub. 33):

For so long as the central plank in the taxation system is income tax, then income tax should be the vehicle for distribution of funds to satisfy social justice needs ... The State, charging the [royalty] levy, does not always talk to the Commonwealth, who runs the income tax system.

This special feature of the Australian version of Crown ownership would appear to detract from the potential for Crown ownership to achieve both efficiency and equity objectives.

The existence in Australia of a third level of government (ie local government) also complicates the Constitutional division of powers as they relate to mineral development. As explained in Section 13, levying of local government rates on the basis of mine output is, in effect, a resource tax. It is also the case (see Section 15) that the cost to developers of industrial and social infrastructure for mines is influenced by the demands of local government.

The case for combining mineral and land rights

One alternative to Crown ownership of minerals is to vest the title to minerals with the owner of the surface land. This would represent a return to the position at common law. What would be the advantages and disadvantages of this property-right regime?

Efficiency arguments

The principal argument in favour of tying mineral rights to surface rights is that it might promote the more efficient allocation of land to alternative uses rather than presuming *a priori* that mining is the preferred use. As discussed in Attachment 2A, 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 resources are utilised in the manner which generates the most wealth (both at any point in time and over time). Decisions on land use would then become ones made on purely 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.

It is perhaps interesting to note that the few participants to this inquiry who raised this form of ownership as a serious alternative to Crown ownership were generally those with an interest in other uses of land (eg pastoralists). The VFF submitted (sub. 84, p.3) that:

Given this pre-emptive right of the Crown and the associated rights that derive from this position, the mining industry holds a unique position in terms of access to the resource base. It is the current view of the VFF that the mining industry has held very limited respect for the very extensive and privileged legal access they currently hold to privately owned land. In this regard there is a lack of 'balance' in the legislative framework which has failed to effectively provide for the interests of private landowners and the community ... These concerns would not exist if negotiations between miners and landowners occurred on the same grounds as other private business arrangements, that is if landowners owned and had royalty rights to minerals.

Even a participant from the mining industry, North BH, in commenting on the difficulties of evaluating the value of devoting land to alternative uses suggested (sub. 33) that:

The move away from these complications requires a re-think of the setting for evaluations. One of the most successful settings throughout recent history has been the free market. An investigation of private ownership of minerals in Australia is warranted for this reason alone ... We do not feel that the present Inquiry can produce a balanced report on this Term of Reference unless that is done.

In general, however, the mining industry strongly opposed the idea of private ownership of minerals. For example, the Association of Mining and Exploration Companies (AMEC, sub. 15, p.48) rejected suggestions that title to minerals should be vested in the landholder and stated that:

A landholder has not been granted his land for mining purposes nor for extracting money for permitting exploration and mining - nor, conversely, for denying the ability of the State to grant rights to its minerals. To revert to private ownership of minerals would set back the mining industry to a position where exploration and mining on private land would practically cease.

Little evidence was provided by AMEC (or the industry generally) to support this last contention. It also begs the question as to whether mining has been over-encouraged by Crown ownership in the past. Nevertheless, there are several arguments which question whether efficiency gains under a combining of mineral and land rights would be realised in practice. Two of these are discussed below.

Transactions costs

Several participants suggested that a system based on private property rights would restrict mining activity because of the transactions costs associated with having to negotiate with possibly a large number of landholders for access to land, particularly where large tracts of land are required (eg in the early stages of exploration). 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 even more evenly dispersed, due to retention of Crown ownership of minerals ...

CRA stated at the initial hearings (Transcript p.518) that in the USA, where there is substantial private ownership of minerals:

Mineral explorers have tended to stay well away from areas where there is private ownership of minerals with a few exceptions and that is where a large company, like say the Ford Motor Company acquired very large land grants and where large railway companies obtained large land grants ...

Similarly, WMC stated (Transcripts p.516-7) that if mineral rights were combined with surface land rights in Australia:

... the mining industry, as in let's say the United States, would then have to deal solely with the owner of the land and not the local Mines Department to get title. I might say part of me tells me that I cannot see what is wrong with that - part of me. Another part of me tells me very clearly, as I have mentioned to you before, that the present system of being able to obtain title to areas determined by geological and perhaps geographical boundaries from a, if you like, a central authority - the Crown, has enhanced the exploration and development of this country quite dramatically.

However, the implied parallels with Australia may not be that strong. 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.

Fragmentation

A further consideration in assessing the likely efficiency gains from linking mineral and land rights is that it may be desirable to prohibit the separation of these rights in future transactions. 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.

By way of evidence for the desirability of maintaining combined title, Barton cites experience in the Canadian provinces of Alberta and British Columbia where there is some private ownership of minerals, and where mineral title has become fragmented over time. Not only have undivided shares in mineral interests been created (eg by family transactions) but there had also been division into small parcels, division by substance, and even division by depth or geological zone. Barton acknowledges that hard statistics are hard to come by, but "it is thought that the majority of freehold minerals in Alberta are held by persons other than the surface owners".

Such fragmentation will increase transactions costs and tend to erode any efficiency gains from private mineral ownership. Indeed, Barton suggests that the conflicts between the surface and mineral owner are likely to be worse, 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."

Equity concerns

In moving to such a system there would be winners and losers. Giving mineral rights to private landowners would provide large windfall gains to some existing landowners. Barton (1989), in commenting on a proposal to combine mineral and land titles, states:

... we are led to ask why (as apparently being suggested) the Crown should transfer assets, in the form of mineral rights, to landowners without payment ... [This] oversight is ... an astonishing one. There is either an assumption that the Crown's mineral rights are worthless, or an assumption that it is proper to give away the country's resources for free.

One response to this argument is that maybe private ownership of mineral rights - by providing strong economic incentives - will result in a bigger mineral cake. To address equity concerns, governments may then need to recoup some of this surplus through the taxation system and distribute it through the welfare system.

The tendency to maintain the status quo

It is often argued that it is not feasible or desirable to move to private mineral rights in Australia because it would represent a radical change in the specification of property rights and in the distribution of wealth. It could equally be argued, however, that the policy of mineral reservation gradually adopted since settlement in Australia itself represented a major departure from the previous position at common law. Moreover, as noted by Ackroyd (1988) in respect of arguments in New Zealand against abandonment of mineral reservation and Crown ownership:

To argue uncritically for a continuation of past practice simply because it is past practice is unsound. To argue that resumption of ownership of the Crown is the simplest option for resolving the fragmented system of mineral ownership is specious. The common law maxim is the simple option; the complicated situation has been created by the reservation of minerals to the State. Cogent arguments in support of rights to minerals being vested in the surface owner include the facilitation of contractual negotiations between landowners and miners, the removal of problems of access, and the protection of the surface owner's interests.

Nevertheless, the Commission agrees with the assessment by the VFF (sub. 84, p.26) that:

... given the modern day emphasis on the public good in resource management assessment and the perceived desire of governments to retain total vestment, the political will to deregulate is not evident at the present time.

In similar terms, the Australian Coal Association suggested (sub. 71, p.22) that:

Governments will not consent to a system which is perceived, rightly or wrongly, to make community resources an article of trade between private companies and leaves development of those resources at their sole discretion. If development does not proceed as expected, governments will want to know why and will, more than likely, change the rules in an attempt to produce the desired result.

2.3 Conclusions

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

To some, 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 (or occupiers) of the land. 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, 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.

There are some further reasons why the Australian system of Crown ownership of minerals, whereby governments manage these resources on behalf of the people, may not lead to the most appropriate development of these resources. First, whilst it might be 'fair' that the net benefits from mineral exploitation should accrue to the community as a whole, there is some evidence that governments, which by their nature tend to have multiple objectives, may not act to secure such a return (eg where they wish to encourage development). On the other hand, the net return to the public from mineral development might be reduced if government intervention serves to discourage mining - for example where the grab for the royalty dollar reduces the size of the industry below the optimum. An excessive focus on the share rather than the size of the mineral cake may well be exacerbated where, as in Australia, several levels of government are involved.

The efficiency benefits associated with private ownership/combined title might be reduced because of the transactions costs and possible fragmentation (separation of title) in subsequent trading. In the Commission's view however, these considerations are not compelling arguments for the retention of Crown ownership. Transactions between explorers and landholders are still necessary under the current system (eg in negotiating compensation payments).

A more serious problem 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), 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 only defined in a 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.

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

If the principle of Crown ownership of minerals is retained then it is important that the arrangements serve as far as possible to promote the efficient use of resources. Ideally, the system should provide incentives for miners to behave as if they owned the land and the minerals beneath it. Other parts of this Volume examine various features of the current system and their effects on incentives for efficiency: means of allocating rights (Section 3); means for charging for the transfer of these rights (Section 14); and conditions attaching to rights (Section 12). In addition to improvements in these areas, the existing system of Crown ownership in Australia would also benefit from a rationalisation of the approaches taken by State, Territory and Commonwealth governments to recouping the value of minerals and distribute these benefits to the community at large (eg by investing part of the proceeds in projects which would benefit future generations of Australians).

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2A WHY WELL-DEFINED PROPERTY RIGHTS ARE IMPORTANT

In general, the better-defined are the rights to assets - comprising the right to use them, appropriate the benefits from using them, and the ability to transfer these rights to others - the stronger are the incentives to use resources efficiently (ie to their best or most profitable use). This is why a market based on private property rights will generally outperform other ownership systems in terms of allocating resources efficiently. Problems can arise, however, where it is difficult or costly to enforce property rights. In these circumstances, the best solution will vary on a case-by-case basis, although mechanisms which harness market incentives are to be generally preferred.

The discussion in Section 2 loosely equated mineral property rights with rights of ownership and access. More precisely, a well-defined property right to an asset confers: the exclusive right to use it; the right to appropriate returns from using it; and the right to voluntarily transfer these rights to others.

Clearly, such rights are meaningful only if they can be enforced and if others respect them. Thus, one definition of property rights (Furubotn & Pejovich 1974, p.3) is that they are:

... the sanctioned behavioural relations among men that arise from the existence of goods and pertain to their use. These relations specify the norms of behaviour with respect to goods that each and every person must observe in his daily interactions with other persons, or bear the costs of non-observance. The term 'good' is used here for anything that yields utility or satisfaction to a person ... The prevailing system of property rights in the community is then, the sum of economic and social relations with respect to scarce resources in which individual members stand to each other.

This definition highlights the mutual interdependence between the legal, political, and economic institutions in a society. How does the way in which society specifies property rights over resources affect its ability to use its resources to improve its overall welfare? We are particularly interested here in rights to explore for and to extract minerals and rights of ownership of and access to land.

The importance of property rights can perhaps best be illustrated by considering the three principal forms of control over assets: no ownership, ownership by the state, and private ownership.

2A.1 Unowned assets

It is possible to identify certain areas of economic activity which have been or are characterised by a lack of well-defined property rights - where the right to use an asset can be exercised by all members of the community. When everyone has a right to use a resource at will, but cannot prevent others from doing the same, there is an incentive for each individual to benefit as much as they can from access to a resource and to do so as quickly as possible. The net result is that a

common property resource will be overexploited from the point of view of the community as a whole. A possible real-world case - property rights over Antarctica - is considered in Box 2A.1. This example illustrates the link between inefficient patterns of resource use and the lack of well-defined individual property rights.

Box 2A.1: The importance of property rights: the case of Antarctica

In recent times, there has been much debate about whether, and on what basis, Antarctica's natural resources should be exploited. How mankind eventually uses this resource will depend crucially on the specification of property rights (ie who owns what). At present, property rights to the continent are ill-defined with many countries having overlapping claims. However, these claims are presently 'on hold' by virtue of an international agreement placing a temporary moratorium on development. What might happen in the absence of this agreement? If individual countries chose to ignore the claims of others and rulings of international courts, Antarctica would effectively become what is termed a common property resource - being both no-one's and everyone's. Sooner or later one country would try to improve its lot by exploring for and developing Antarctica's natural resources. Other nations, without legal recourse to stop them, could either sit idly by or get in for their piece of the action. With the emphasis on each country benefiting as much as possible as quickly as possible, the exploration of Antarctica's resources could be expected to be swift and complete. It is unlikely that this would represent the optimal use of this unique resource.

2A.2 State ownership

One response to the problems arising from lack of ownership rights over assets is to vest property rights in the state. Indeed, the transition from anarchy to an ordered society requires the advent of some form of government or group of leaders with approval of the population to define the laws - including property rights - which will govern the way in which society operates. Intervention by governments on behalf of their constituents by assuming the role of ultimate resource owner and allocator of mineral rights during the virtual anarchy of the early gold rush days in Australia could be interpreted in this vein (refer Appendix G of Volume 2).

Although assumption of property rights by the state is likely to represent a significant improvement over no ownership at all (sometimes referred to as the 'tragedy of the commons'), there are some grounds for questioning whether such a regime ensures that resources are used efficiently. In particular, those managing resources on behalf of the state usually have the right to exploit them, but do not have the right to appropriate the associated returns - thus dulling the incentives to put resources to their most productive use. Also, by definition, state ownership - if it is to continue - prevents the transfer of these rights to others who may value the resource more highly. Multiple and conflicting objectives set by governments often represent a further constraint on the efficient use of public resources (see IAC 1989).

2A.3 Private ownership

The allocation of full property rights to individuals - including not only the right to use a resource but also to appropriate the returns from its use and the right to transfer all or part of these rights to others - is another possible solution to the common property problem.

What difference might specification of rights in this manner make to the efficiency with which society's scarce resources are used?

Consider an individual with full property rights to a tract of land. With exclusive rights to use this land and to retain the benefits from doing so (with these rights being protected by laws against trespass and robbery), the individual now has a strong incentive to manage the land as productively as possible, not only in the short run but over the longer term. Of course, if the land is used inefficiently, it is the landowner who now bears the full cost. Whether the land is used for mining, farming, forestry, or some other use (or some combination of uses) will depend upon the particular characteristics of the land and the skills of the landowner. Alternatively, the owner may choose to transfer the property rights to others who consider that they can use the land more efficiently and therefore value it more highly. This higher value is reflected in the market prices which people are prepared to pay in order to secure property rights over assets. The establishment of exclusive transferable property rights to assets thus permits the creation of a market for these rights and ensures that resources tend to go to those who can make the best use of them.

It is important to emphasize that this result depends critically upon the property rights being 'full' property rights in the sense previously defined. That is, any restrictions on the right to use an asset, the right to benefits from using it, or on the ability to transfer these rights to others will almost certainly result in a sub-optimal use of resources.

Competitive markets based on well-defined private property rights will provide incentives for the resource base to be used efficiently not only at any point but also over time. Again, this is a fortuitous result of self-interested individuals acting to maximise the present value of the resources which they own. Thus, for example, the owner of a mineral property right could use the resource to earn current income (eg by mining the resource and selling the ore, or by selling or leasing the right to do so to others), or alternatively leave the resource in the ground for future use. As discussed in more detail in a previous Commission discussion paper (IAC 1988, p.27), an investor will hold on to in-situ mineral resources if the current price is less than the expected present value of all future returns. This might be the case, for example, if the resource was expected to become particularly scarce in the future. In Demsetz's terminology, a private property holder acts in effect as a broker whose wealth depends on how well they take into account the competing claims of present and future generations (Demsetz 1974).

It is important to bear in mind that the term 'property rights' is used here in relation not only to material goods and services but also to less tangible goods such as a pleasant environment. Moreover, new discoveries or changes in technology may mean that something not previously recognised as having value - a previously unknown mineral deposit or the previously inaccessible continent of Antarctica - suddenly becomes recognised as a valuable resource. Not surprisingly, individuals in society will lobby to have the property right assigned to them. Provided property

rights are fully transferable, the final allocation of resources to different uses will be the same regardless of how property rights are assigned initially. The initial allocation will, however, impact heavily on the distribution of wealth. While the political processes associated with determining ownership are in train however, the confusion over property rights to the resource may lead to inefficiencies. The current situation with Aboriginal land rights (discussed in Section 4 below) is a case in point.

Where markets may fail

The foregoing discussion suggests that a free market based on the voluntary transfer of private property rights will automatically result in society making the best of the resources at its disposal. Unfortunately, this is not always the case. Why not?

A market approach to allocating resources tends to run into problems when property rights either do not exist or where it is practically impossible or prohibitively costly to define and/or enforce them. Under these circumstances resources may be prevented from flowing to their most highly valued use because of the lack of a basis for trade or because the costs of negotiating mutually beneficial outcomes are prohibitive. What are some examples of where such situations might arise in the context of the mining and minerals processing industries?

One example might be the cost of negotiating access to land for exploration purposes with a large number of landholders. Despite the fact that the benefits to society from exploration may far outweigh the costs (in terms of disruption to existing uses and damage to land) in a particular case, the prohibitive costs of negotiating compensation with each individual landowner affected may prevent such exploration ever occurring.

Another problem is that not all assets in society have well-defined property rights attached to them. This might reflect the fact that the resource has only recently been recognised as such (eg Antarctica) or that it is too hard or costly to define property rights (eg rights to clean air). As common property, these resources will tend to be used inefficiently since individuals do not themselves bear the full costs or benefits from their use (as in the Antarctica example). Situations where the action of one individual has incidental effects (either positive or negative) on the welfare of others but is not reflected in the marketplace, is commonly known as an 'externality'. Externalities represent a problem because their existence implies that the incentive framework facing individuals is not one consistent with society making the best use of its resources - there is a divergence between private and social costs and benefits of economic activities. Further discussion of externalities and how they might be addressed is taken up in Part II (Mining and environmental concerns).

Problems also arise where private property rights exist, but cannot be enforced because it is simply too hard or costly to exclude others from using the asset (non-exclusivity) or from sharing in the benefits accruing to the user of the asset (non-rivalry). Those non-excludable goods which also have the characteristics of non-rivalry (ie the amount of consumption by one person does not reduce the amount available to others) are termed public goods. In such cases, the inability to

charge for the services provided by an asset is likely to lead to its under-provision. For example, the public good nature of information could result in underinvestment in information-gathering activities such as assembling basic information on the geology of Australia because it may not be possible to appropriate all the benefits from undertaking such activity. Similar arguments might apply to conservation goods (eg national parks) where some of the benefits provided (eg existence value) are non-rivalrous and non-excludable.

In each of the above situations, the market will fail to value these resources appropriately, since their value to any one person is less than that to society as a whole. In these circumstances, the market, left to itself, will not lead to the best use being made of the community's scarce resources. Does this justify government intervention? If so, what form should such intervention take? These questions raise a number of considerations.

Possible solutions

The fact that the market sometimes fails to allocate resources efficiently does not in itself justify government intervention. Intervention will only be justified if the benefits from doing so outweigh the costs. Thus, for example, there will be a point when cleaning up pollution costs more than the resultant benefits to society. Moreover, government interventions may have adverse side-effects. Second, where intervention is considered justified, the most cost-effective method will depend upon the nature of the problem. As noted by ABARE (1988, p.5):

There is a spectrum of possible approaches, ranging from market based mechanisms to regulation. Where lack of information is a problem (as when market participants are unaware of the extent and causes of land degradation) the most cost effective intervention may simply be one of providing the information. In other cases, the solution may involve the creation of property rights and other incentive mechanisms required to establish a competitive market. At the other extreme, the government may be required to own and manage the resource (for example, national parks) or to ban or restrict certain practices (for example, the clearing of trees on farms). Between these extremes, combinations of market based and regulatory policies can be applied. These include the use of taxes, subsidies and quotas, in combination with market incentives, with the basic objective of reducing the divergence between private and social costs of resource use (such as the allocation of ITQs [individual transferable quotas] in the southern bluefin tuna fishery).

It is beyond the scope of this attachment to discuss in detail the relative merits of alternative approaches to correcting market failure. This debate is taken up (in the context of allocating environmental services) in Section 7. However, the main conclusions to be drawn from the discussion there are that traditional 'command and control' approaches tend to be relatively inefficient means of achieving the end objective. Considerable scope would seem to exist for implementing market-based solutions based on respecified property rights. In those cases where it is not feasible to use markets to bring full costs and benefits to account and a need arises for primary reliance on regulation, it is important to bring them explicitly into decision-making processes (eg via a cost-benefit analysis).

2A.4 Conclusions

A number of broad principles have emerged from this discussion. A general theme is that the specification of well-defined fully transferable property rights over valuable assets (including those owned by the community as a whole) will generally provide the basis for economic interactions which result in the best use being made of a community's scarce resources. This implies that restrictions on the rights to use mineral resources, retain the benefits from their use, or to transfer these rights to others are likely to reduce the incentives to use these resources efficiently.

Efficient exploitation of society's mineral resources, however, is not necessarily consistent with the most efficient use of society's total resources, if mining activity has adverse effects on other activities which are not reflected in the private costs to miners. While some intervention aimed at ensuring that such costs are taken into account may be justified, the most cost-effective method of this intervention will vary on a case-by-case basis. Other things being equal, however, there are good grounds for preferring those which rely as far as possible on market-based incentives.

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3 ALLOCATION OF EXPLORATION AND MINING RIGHTS

In a system where mineral rights are owned by the Crown but where governments generally prefer mineral resources to be developed by the private sector, some mechanism for transferring exploration and mining rights to private hands is needed. Clearly, the type of mineral rights offered and the way they are allocated (along with the mechanisms governments adopt for charging 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. This section looks at various combinations of type of mineral right and method of allocating those rights, before advocating the combination it believes would best serve the objective of developing an efficient mining and minerals processing sector in Australia.

Section 2 described the Australian system of Crown ownership of minerals and the way in which State/Territory Governments control and exercise their rights to these resources. Assuming Crown ownership is retained as a basic tenet of the system, it is important that governments encourage mineral resources to be developed in ways which maximise the benefits to the community at large. The incentives for miners to do this will depend heavily on the type of mineral rights on offer, the means by which they are transferred to private interests, and how payments for this transfer of rights is effected (eg the nature of any royalty regime to apply at the mining stage). In particular, the nature of any conditions attaching to mineral rights transferred to private hands can be expected to have significant efficiency effects.

This section addresses the type of mineral rights which governments confer (or could confer) and how mineral rights are allocated. Are existing mineral rights appropriate? How are exploration permits and mining leases allocated at present? Is the present system the best one? What are the alternatives?

There are, of course, close links between allocation systems, royalties, and conditions imposed on exploration/mining rights. Royalties - the need for which arises because resources are not sold outright - are discussed in Section 14 of this volume. Conditions commonly imposed by governments on holders of exploration or mining rights and their effects are discussed further in Section 12.

After outlining existing arrangements this section looks at other possible rights over minerals and allocation mechanisms which may be considered. The relative merits of various combinations of type of property right and method of allocation are then assessed, before recommending the system which the Commission considers to be the most desirable.

3.1 The highly conditional nature of existing mineral property right/allocation systems

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 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 the first applicant. Simultaneous applications may be resolved by ballot or (more usually) by assessing proposed work programs. The holder of the exploration licence normally has priority when applying for mining rights over the same land should valuable minerals be 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 do with minimising adverse environmental consequences) - 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 typically 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 'first come first served' (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.

3.2 Alternative allocation methods

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 third (and obvious) method 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 this method 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.

3.3 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 that "mineral exploration, if taken in its entirety, is an unsatisfactory investment, viewed on average economic returns" (sub. 238, p.9). 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).¹ It is value added,² not gross value, which is the proper measure of the contribution an activity makes to the

¹ 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 established that a discovery justifies mining, but the boundaries of the deposit remain to be fully established).

² The value added by production is a measure of the net contribution of an activity to the overall value of goods and services produced in an economy. The value added of an industry is equal to the value of the goods and services it produces after deducting the cost of goods and services used in the process of production. Value added accrues to the factors of production involved.

economic welfare of the community. 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 desirably 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. Thus 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 in and over time), and only secondarily in mechanisms (such as the imposition of royalties) by which the community can secure an appropriate return from assigning to others the right to exploit Australia's mineral wealth.

3.4 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 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 - known as 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 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

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) in respect of 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 (sub. 190, p.1) indicated:

The economic rent available from a project can be critically dependant 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 halfway through the game (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 midway through 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 (eg because the nature of the project 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 (whose exact nature 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 coping with 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 Section 14 - 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 and 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 be a loser, including governments, the community and explorers/miners (who may well respond to the situation 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 to 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.

3.5 Possible problems with the type of mineral rights being advocated

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 estateing'.

Externalities

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 imposition of compulsory disclosure conditions on exploration rights in order to encourage more exploration that would otherwise be undertaken. 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. 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).³

Real estating

Several participants argued against the granting of 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 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 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.

³ 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.

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 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 Australia's mineral wealth).

3.6 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 in their capacity as owners 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 be 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

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. Such rent dissipation is more likely in areas where there is likely to be competition to be the first to discover a resource. AMIC noted (sub. 29, p.80):

In practice, competition for mineral exploration leases is the exception rather than the rule. Normally, a company will engage in preliminary exploration over a broad area, and, if a prospective area is identified, the company will apply for an exploration lease. In most cases only one company will apply for the lease. Therefore, a priority allocation method may not result in a substantial dissipation of rent. This is not to say that in the case of highly prospective areas that the problem of rent dissipation will not occur.

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 and that 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 somewhere 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 lease until the deposit was found by some lucky explorer. 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 (see IAC 1988, p.35).

The Australian Coal Association (ACA) argued (sub. 71, p.21) that any premature exploration or development occurring under existing FCFS systems derive mainly from the conditions usually attached to tenement rights and argued that the positive features of 'first come first served' and 'work bidding' can be maximised and their potential inefficiencies minimised if:

- tenement areas are sufficiently large and rates of relinquishment relatively modest;
- full disclosure of exploration results is required;
- a "retention" lease is included to provide the holder with a breathing space between exploration and development; and
- the conditions attached to exploration rights relate only to limited duration or, if expenditure requirements are included they are set at minimum levels and amenable to negotiation.

CRA acknowledged (sub. 73, p.28) that under existing allocation systems "an increasing number of conditions attached to titles, many subject to arbitrary decisions on performance and thus increasing insecurity of title". The discussion in Section 12 suggests that the necessity to comply with various lease conditions may result in resources being developed in an inefficient way.

One reason for having such requirements in the first place appears to be to guard against the possibility of individuals or companies taking up lease with no genuine intention to explore or develop them, but rather to make a capital gain if nearby leases prove prospective. CRA considered (sub. 73, p.34) that the scenario of 'real estate' is less likely under a priority of application system which is conditional "ie a grant is discretionary based upon such other things as the applicant's past track record, financial standing, technical ability, work programme proposals etc".

The challenge is then to design conditions which prevent 'real estate' from behaving opportunistically under a FCFS system but do not simultaneously distort production decisions.

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 Australian governments 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. (Of course, the principal reason for low bids is the highly encumbered nature of the property rights on offer) 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.

Work program bidding

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 WA Department of Resources Development (sub. 48) noted that whilst the 'first in time' allocation system was normally used in Australia and overseas, there have been occasions where work program bidding has been used, generally when land previously reserved by government for specific purposes has been released to allow all interested parties an equal opportunity to secure the ground. Work program bidding has also been used to reallocate a mining lease which has been surrendered by the previous holder breaking the lease conditions.

ACA (sub. 71, p.20) and many other participants recognised that competitive work tendering may be appropriate for areas where the location and extent of mineral deposits are well known (eg the Bowen Basin coal regions of Queensland). Coal reserves in NSW are allocated on a tender system with final allocation depending on the relevant Minister's assessment of the technical and financial merits of the proposal ... In some cases cash forms part of the bid so that the system becomes a mix of the 'work program' and 'cash bidding' systems.

Work program bidding systems seem to reflect a wish of State governments to attract development to their State and generally to encourage mining. However, work program bidding engenders similar problems to those under FCFS which specify minimum expenditure commitments and other obligations. Prior commitments to a specific work program may prevent the developer from taking decisions on extraction as seem appropriate at the time. Stockdale Prospecting, for example 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.

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 cash payments to the government, would sooner devote the same funds to exploration. A counter argument is that the statement assumes 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 society as a whole. 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 judgements 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.

It is sometimes argued that the tendency for work program bidding systems to encourage earlier and faster development than would otherwise occur may simply offset other distortions in the marketplace which tend to delay development (eg production-based royalties or under-provision of exploration to the extent it has public good characteristics). AMIC (sub. 29, p.80) stated that:

While work program bidding approaches on their own are potentially seriously distortionary, they are usually combined with ad valorem or per unit royalties on production which may offset these distortions ... To some degree the stimulus to exploration and output induced by these methods of allocating resources is likely to be offset by the negative effects of ad valorem or specific royalties. However, the information needed to make these measures fully offsetting is simply unavailable. Thus, these measures are likely to remain less efficient than alternative measures which do not introduce such distortions.

The Commission agrees that the preferred approach is to address directly the problem causing the initial distortion (eg work program bidding systems which encourage premature activity) rather than to attempt to impose offsetting distortions elsewhere (eg royalties which tax production).

Cash bidding (auctions)

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 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 cash bidding for 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, cash bidding is the most efficient allocation mechanism.

Many participants argued against cash bidding on grounds that this would reduce exploration funds. In fact, the bid represents part of the expected mineral rent and as such should be regarded as an ex ante (or up-front) component of the royalty system (and would, indeed, constitute the only royalty payment if governments chose not to include pre-announced royalty arrangements as a component of the conditions attaching to mineral rights over a particular area). Bids should therefore be regarded as having no connection with exploration programs, being a forward commitment against possible future royalty payments. (Royalties are discussed in Chapter 6.)

Uncertainty and sovereign risk

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 these sorts of dilemmas). 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 serious 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 heavily discount one's bid to cover that eventually. 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.

The simple answer to the problem of sovereign risk is that governments should arrange the charging systems for the right to exploit minerals (eg a cash bid plus an appropriate royalty scheme which is known in advance) so that they are not subsequently tempted to change the rules (eg because increased oil prices suddenly make certain coal deposits far more valuable than previously reckoned). Thus the real importance of the sovereign risk argument is that the allocation of exploration rights could be subject to a pre-announced royalty on any subsequent development phase, so as to limit reliance on the cash bid as the only royalty payment made in respect of any minerals which may be discovered in a particular area (see Section 14 for a discussion of what the Commission regards as appropriate royalty arrangements).

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 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).

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 whose mineral rights are to be auctioned, when and how, but not necessarily 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 including, presumably the party triggering the auction - but that is the case with the status quo anyway.)

On the issue of reserve prices, the Commission's view is that, while administrative costs should be recovered (eg via charges 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.

Auctions should be open to all, including people like rural landowners interested in acquiring sub-surface rights to complement their control over what happens on the surface, and conservation groups intent on preventing mineral rights to a particular area being exercised at all. (Governments if they wish to preserve a particular area where rights have already been auctioned, could buy back the relevant mineral right).

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

Another argument raised by many participants was that a cash bidding system 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 rights over that area (or even worse have to reveal what they know and still not win the auction). If so, the conduct of off-site and pre-lease on ground exploration would clearly be substantially discouraged.

However, those who conduct off-site research and pre-lease exploration could be expected to know more than those who do not and so should be in a much better position to win the auction. Nevertheless, 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, then the auction could be conducted on the basis of sealed bids. 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'.

Auction results, including details of the winner, winning bid and range of other bids made, should also be made publicly available to inform future auctions.

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 in and some notable successes in the past. If this is a problem, and cannot be got around, for example, by formation of 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 Dension 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.

3.7 Which system of mineral rights and method of allocation would be best?

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

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

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 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 alternative allocation systems:

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:

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, unconditional and tradeable mineral rights to those who walk through the door first.

Finally, the Commission wishes to stress its comments about sovereign risk. 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 represents a more substantial impact affecting current exploration and mining investment. Besides resort to agreements with mining companies which are embodied in legislation, cash bidding subject to a known royalty regime is less likely to result in infringement of the rules by governments. (The latter contention is taken up in Chapter 6.)

3.8 Conclusions

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 necessarily be made public and the auction run on the basis of sealed bids.

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 Section 14).

REFERENCES

IAC (Industries Assistance Commission) 1988, *Assistance to Mining: some issues and preliminary analysis*, AGPS, Canberra.

IAC 1989, *Government (Non-Tax) Charges*, no.422, AGPS, Canberra.

4 ABORIGINAL PROPERTY RIGHTS

The issue of Aboriginal property rights raises complex moral and social questions. Nevertheless what is clear is that existing mechanisms for resolving conflicts over use of Aboriginal land are unsatisfactory. The mining industry and Aborigines are both dissatisfied. The discussion here focuses on underlying incentives and economic consequences of existing arrangements and suggests some improvements, taking into account the social objectives of governments in relation to Aborigines.

It is common for prospective mining ventures 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 mineral deposits and the property rights of Aborigines. Recently, these conflicts have been brought into sharper focus as miners extend their activities into more remote locations and against a political background of increasing calls to grant Aborigines land rights in response to perceived wrongs of previous generations.¹

What property 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 resolved affect the efficiency and development of the mining and minerals processing industries? Do current arrangements allow Aborigines to assert their rights effectively? These and related issues are addressed in this section of the report.

Since Aboriginal land rights has had by far the greatest impact on mining and mineral processing activities in the Northern Territory (NT) and given that the great majority of relevant submissions focussed on Aboriginal issues in the NT rather than the States, this section predominantly discusses the NT situation, with some discussion of the situation in the States.

4.1 Commonwealth Government policy

Current Government policy 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 (Australia, House of Representatives 1987).

¹ See Attachment 4A for a brief description of the evolution of Aboriginal land rights legislation in Australia.

This statement also indicated that an important part of this policy would be:

the provision, in conjunction with the States or separately, of land for Aboriginal and Torres Strait Islander people under secure long-term tenure arrangements including, wherever practicable, inalienable communal freehold title for the purposes of:

- maintaining or re-establishing their links with traditional lands; and
- assisting them meet their economic and social needs.

Although a 1967 referendum had given the Commonwealth power to legislate for Aborigines concurrently with State governments, the Commonwealth announced in 1986 that a State-by-State approach would be more appropriate than national land rights legislation.² However, the Commonwealth indicated that it would be prepared to legislate where a State government is unwilling or unable to do so. At present, however, only the Northern Territory has comprehensive Aboriginal land rights legislation.³

4.2 Northern Territory situation

Legislation

The *Aboriginal Land Rights (Northern Territory) Act 1976* (the Land Rights Act) was a Commonwealth Government initiative which pre-dated self-government in the Territory. The legislation reflects a substantial part (but not all) of the recommendations of the second report of the Aboriginal Land Rights Commission (the Woodward Report) presented in May 1974. The basic thrust of that report was twofold: that mineral property rights should remain with the Crown because of a "belief in the general approach adopted in this country that minerals belong to all the people"; but that Aborigines should have special rights over their land because:

... they stand to lose so much more by the industrial invasion of their traditional lands and their privacy than other citizens would lose in similar circumstances ... To deny Aborigines the right to prevent mining of their land is to deny the reality of their land rights (Woodward 1974, p.108).

The main features of the original Land Rights Act as they affected the mining and minerals processing industries were:

- 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;

² This approach was adopted in recognition of "the different land needs of Aboriginal and Torres Strait Islander people in the different States and the progress being made by State Governments towards the provision of secure land tenure for Aboriginal and Torres Strait Islander people" (DAA 1989, p.32).

³ The current position with respect to land rights legislation in the other States is detailed in Attachment 4A.

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- Land Councils were established to discover and express the wishes and protect the interests of the traditional owners in the administration of land held by the Trusts and to perform other functions, including assisting (particularly by providing legal assistance) in claims to traditional land not already owned by someone else (ie unalienated Crown land);
 - consent of the relevant Land Council and the Minister [for Aboriginal Affairs] was required before either exploration or mining was to be allowed on Aboriginal land. However, refusal to consent could be overruled by the government of the day if such exploration and development was considered to be in the national interest;
 - developers were required to negotiate with the relevant Land Council for this consent and on the terms and conditions of mining developments. Disputes were to be settled by an independent arbitrator. Land Councils in turn were to consult with Aborigines having an interest in the land;
 - royalties were to be paid to the Crown (generally the Northern Territory Government - but the Commonwealth in the case of uranium) but 'royalty equivalents' were to be paid out of Consolidated Revenue into the Aboriginal Benefits Trust Account (ABTA). Thirty per cent of this money was to go to local Aborigines, 40 per cent to the Land Councils, and 30 per cent was to be used for the benefit of NT Aborigines generally;
 - Aboriginal Land Commissioners were to be appointed to determine land claims and to advise the relevant Minister on land claims and related matters.

The Act was to apply only in relation to land subject to Aboriginal title. Furthermore, the power of veto did not apply to mining interests existing on Aboriginal land prior to 1976.

Since its proclamation on Australia Day 1977, the Land Rights Act has been subject to considerable amendment. In 1978, the Act was changed to give effect to many of the recommendations of the Ranger Uranium Environmental Inquiry. Further changes to the Act stemmed from a major review of the Land Rights Act in 1983 by Justice Toohey.

The most recent amendments occurred in 1987 in response to claims 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 was still required before exploration could commence, consent cannot now be withdrawn if a company wishes to proceed to the mining stage. In addition, limitations have been placed both on the time given owners to negotiate with companies (12 months - although this is able to be extended in certain circumstances) and to decide whether or not to permit exploration, and 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 no agreement can be reached, however, the Minister can appoint a Mining Commissioner to attempt to settle the disagreement by conciliation, or failing that, by arbitration.

The *Land Rights Act* was also amended so that if an Exploration Licence Application is vetoed, no further application for that area of land can be made within five years of the veto, except with the consent of the Minister or the relevant Land Council. The Act goes on to specify that the Minister shall not give consent to a person other than the previous holder without the consent of that previous holder.

The *Land Rights Act* left a range of matters to be determined by the NT Legislative Assembly through complementary legislation. The Assembly subsequently passed two Acts:

- the *Aboriginal Land Act 1978*, which made it an offence for any non-Aborigine to enter or remain upon Aboriginal land without a permit; and
- the *Aboriginal Sacred Sites Act 1978*, which established the Aboriginal Sacred Sites Authority, whose functions include the registering, evaluating, recording and protecting of sacred sites.

How efficient are existing arrangements?

The current institutional arrangements for dealing with applications to explore and mine on Aboriginal land in the Northern Territory are not working well (some would say are not working at all). Communication is poor and there is little trust (see Volume 4 'Who speaks for the Jawoyn', for a graphic illustration of this). The mining industry, the Aborigines and the NT Government are all dissatisfied. Whilst there is widespread agreement that the existing system is unsatisfactory, views on the causes of the problems and the possible solutions vary considerably. The following material presents the views of the mining industry, some Aboriginal views and finally, the view and conclusions of the Commission.

Views of the mining industry

Despite recent changes, the mining industry has claimed that the specification of rights under the Land Rights Act has stymied the development of the industry in the Territory. The Australian Mining Industry Council (AMIC sub. 29, p.37) submitted 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. It further claimed that 17 exploration companies have been notified of Aboriginal vetoes over approximately 65 exploration licence applications covering 37 400 square kilometres of some of the most prospective land in the Territory. (Once vetoed, the possibility of exploring such land is usually automatically precluded for five years.)

- the right of veto

This Aboriginal right of veto is seen by the mining industry as a major impediment to the development and growth of the industry in the Northern Territory. In AMIC's view:

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 1989).

Thus, AMIC considers that the existing legislation confers unwarranted precedence of the land rights of Aboriginals over the rights of all Australians to access mineral resources. It has advocated a system for accessing Aboriginal land on the same basis as that generally applying to landowners/landholders in Australia; that is, by negotiation (with provision for arbitration) over the terms of access, but with no right of veto.

- once-only consent

Stockdale Prospecting (Ltd) stated (Stockdale, sub. 119, p.3) "We oppose the veto on Aboriginal land in the Northern Territory ..." but went on to say that:

... if it is felt that a veto must be retained for political reasons this company would prefer it to be available to Aborigines on restricted conditions at the mining lease stage, not prior to exploration commencing. ... While such a 'disjunctive' approach involves the explorer taking a high risk ... we see it as preferable to the present flat rejection. We would expect during the exploration phase to have established a sufficiently frank relationship with the traditional owners to know long before the critical time whether or not the veto was likely to be exercised.

The NT Government described (sub. 136, p.10) the problem by saying:

In 1987, when the Commonwealth was convinced that the [Land Rights] Act was not working, the new mining regime was introduced. One of the major changes was that the second or developmental veto was removed. The Land Councils could not veto subsequent development if they had given consent to exploration. Thus a disjunctive⁴ regime was enshrined in the legislation albeit with no second veto. Unfortunately, the Land Councils (and a minority of mining companies) are largely ignoring the intent of the new provisions and have reverted to the old conjunctive process. A major obstacle has therefore been created by the insistence of the Land Councils to negotiate the mining provisions at the exploration stage, a *de facto* conjunctive approach.

- compensation

AMIC considered that compensation for access to Aboriginal land should be based on generally accepted valuation principles, rather than the value of any mineral resources (which after all are owned by the community generally). It contended that royalties should be no different to those generally payable under mining legislation. What was done with the money is seen as a matter for government, with transfer to Aborigines one option.

⁴ Disjunctive agreements entail independent approval decisions for the exploration and mining stages. Conjunctive agreements refer to the situation where exploration and mining are consented to at the outset, generally with terms and conditions negotiable if the project proceeds to the mining stage.

In this regard, the NT Government noted (sub. 136, p.6):

Under the provisions of the *[Land Rights] Act*, it clearly states that when reaching agreement upon the terms and conditions for an exploration licence, payment shall be compensation for damage or disturbance to the land. It specifically states that it shall not include compensation for the value of the minerals. A major stumbling block to reaching exploration agreements has been the Land Council's insistence on negotiating private royalties at the exploration stage (ie prior to the company even setting foot on the land).

The industry claimed that the ability of Aborigines to extract potentially unlimited compensation for development was a major impediment to mining. For example, Stockdale (sub. 43, p.3) contended that the \$144 million that ABTA received in royalties from the time mining commenced at Kakadu until 1989 was:

... clearly ... an absurd figure in terms of compensation for the deleterious effects of mining on Aboriginal lifestyle. Aboriginal welfare and advancement are primarily the responsibility of governments, not miners, in our society.

- land under claim

A further concern with the current legislation is the uncertainty engendered over the position of possible developments in areas subject to pending Aboriginal land claims. Although the Land Rights Act does not apply to such land, AMIC claimed that doubts over the future status of such land significantly reduces exploration incentives.

- representation of traditional owners

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

... although there have been some notable successes such as the Granites mine and the Palm Valley and Mereenie oil and gas fields, 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.

In commenting on its experiences, Energy Resources of Australia (ERA) noted (sub. 57, p.49) that:

On some issues there has been conflict between ERA and the NLC [Northern Land Council] to the extent that legal action has eventuated. There have been instances where, in ERA's opinion, the NLC has taken action it has suggested was in accordance with the wishes of the traditional owners when ERA has contrary advice from these same people.

Stockdale submitted (sub. 119, p.2) that:

On the basis of our experience we believe the best arrangement is to allow explorers direct access to traditional owners. This is frequently opposed or discouraged by Land Councils or governmental bureaucracies who can often prevent face-to-face contact with Aboriginal communities by their control over access. Their resistance may be because of fear that direct relationships between explorers and Aborigines are likely to reduce their power and ability to influence the latter, or because in their paternalistic view the Aborigines could be suborned by the glib promises of the more worldly white man. Such attitudes underestimate the ability of Aboriginal traditional owners and/or communities to determine and act in their own best interests, and in addition misunderstand the objectives of explorers such as ourselves. ... we see the role of Land Councils or government bureaucracies as being to facilitate the development of the traditional owner/explorer relationship. Of course Aborigines can seek advice or outside representation if they wish but it should be to assist them, not pressure them to accept some ideological position.

The NT Government agreed with the industry view (sub. 136, p.13):

There is a growing number of traditional owners who would prefer to have more control over their own affairs, but because they are forced to use the Land Councils for their legal and technical advice, negotiations are stalemated and once again the ground is left unexplored. ... Procedures could be vastly improved if negotiations could be carried out by those chosen by the traditional owners.

Aboriginal views

- the right of veto

The Land Councils believe that land owned by Aborigines should include the right to minerals below that land. The Northern Land Council contended (NLC, sub. 28, p.16) 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 essence still pervade those places and are retained in the soil and the rocks.

Both the Northern and Central Land Councils argued that mineral property 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 mineral property rights, of the need for Aborigines to completely control development on their land:

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 to be done with it.

In support of these view, the NLC 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 (see Box 4.1) into Aboriginal land rights have supported the principle of control being given to traditional Aboriginal landowners.

- poor attitude of some mining companies

The Land Councils and other Aboriginal groups contended that many of the difficulties associated with mining on Aboriginal land in the NT were largely of the industry's own making, and that some companies preferred to pursue their objectives via political lobbying rather than entering genuine negotiations with Aborigines. For example, the Central Land Council considered (CLC, sub. 38, p.7) that:

There are two major factors which form the basis for successful negotiations over access to Aboriginal land. 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. When an applicant shows indifference, or even hostility, to cultural concerns, or cannot command the financial or technical resources to undertake mineral development, then understandably traditional Aboriginal land owners will be extremely reluctant to provide access to their land to that applicant.

The CLC further suggested that:

... arguments relating to restrictions on land access by many mining companies and industry associations are essentially motivated by a desire to reduce the costs of agreements negotiated prior to gaining access to particular areas of land. Many of the companies which have objected strenuously to the proposed terms and conditions of access to Aboriginal land in the Northern Territory have been quite prepared to negotiate agreements with other parties which provide for far more generous terms and conditions. This includes agreements with indigenous people in other parts of the world, as well as other commercial parties, such as in joint ventures and farm-in agreements.

Box 4.1: Should Aborigines have the right of veto?

I believe that to deny Aborigines the right to prevent mining is to deny the reality of their land rights

- Justice Woodward (*Second Report of the Aboriginal Land Rights Commission*, 1974)

They [Aboriginal people] are a community whose lives have been, and are still being, disrupted by the intrusions of an alien people. They feel the pressures of white man's activities in relation to the land. In the face of mining exploration, and the threat of much further development, they feel helpless and lost. Their culture, their traditional social organisation, do not enable them to cope with the many problems and questions to which this development gives rise. ... Their custom is to arrive at important decisions after long deliberation among themselves, sometimes over a period of months or even years. In relation to matters outside tribal tradition, they have not delegated authority to make decisions to any one or more persons. ... Their concerns and values are different from those held by the white man".

- Justice Fox (*Second Report of the Ranger Uranium Environmental Inquiry*, 1977)

It is quite reasonable that the giving or withholding of consent is not subject to arbitration. If they choose not to permit the granting of a mining interest, the traditional owners are doing no more than exercising their legal rights. To subject the decision to arbitration would seriously weaken those rights.

- Justice Toohey (1983)

My assessment is that there is no compelling economic reason why, in the interest of the broader community, Aboriginal communities should not be afforded control over mining or petroleum activity on Aboriginal lands.

- Mr Paul Seamen QC, (*Report of the Aboriginal Land Inquiry (WA)*, 1984)

- difficulties imposed by new legislative requirements

The Land Councils considered that the recent changes to the legislation had led to an administratively cumbersome and time-consuming system. The NLC stated (sub. 28, p.33) that the flood of Exploration Licence Applications (ELAs), together with the time limits imposed on negotiations, has:

... imposed considerable costs on the Land Council, since consultations with traditional owners for all of these ELAs had to be undertaken. These meetings are major logistical exercises. They are usually held on the land under application which is quite often in a remote area, and necessitate gathering all of the people with traditional rights to the land and ensuring they are familiar with the relevant provisions of the Aboriginal Land Rights Act.

The NLC noted (sub. 28, p.64) that, since the 1987 amendments:

If the parties are unable to agree as to the terms and conditions to which the grant of the exploration licence will be subject, they may request the Minister to appoint a mining commissioner. The mining commissioner must endeavour to resolve differences between them by conciliation or, failing that, by arbitration. Prior to the appointment of a mining commissioner the Land Council may refuse to consent to the grant of an exploration licence. It is important to note that the applicant will have the right but not the obligation to enter into agreement with the Land Council on the basis of the mining commissioner's determination. The Land Council however does not have this right and certainly does not have the right to elect which companies they deal with. Thus the "so-called" arbitration is in effect conciliation so far as the applicant is concerned. It will not be compelled to enter into the agreement.

- once-only consent

The Land Councils disagree with the 1987 amendment to the Land Rights Act which removed the Aborigines' veto at the mining stage of a project. The NLC stated that Aboriginal people should have the right to give or withhold consent to projects at both the exploration stage *and* the mining stage, arguing (sub. 28, p.26) that:

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

It 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.

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

Were nothing else achieved through this submission but to have it recognised that disjunction, or the ability to include terms and conditions for the mining phase in an exploration agreement, is allowed by the Aboriginal Land Rights Act, this would simplify matters significantly for traditional owners, when giving consideration to consenting to an exploration proposal.

- compensation

The issue of recompense for access to land and exploitation of minerals was seen as very important. The CLC submitted (sub. 38, p.11) that it was:

... concerned that the NT Government may not be maximising its royalty income, and therefore the return to the community from the exploitation of publicly owned resources, from existing projects on Aboriginal land. In particular, the CLC is concerned that the NT Government, which audits all of the companies (including the uranium companies with respect to the Commonwealth royalties), may not be adequately auditing these companies. If this is the case, then the flow of royalty equivalent income onto the ABTA will be affected.

The NLC echoed those concerns and went on to note (sub. 28, p.31):

It is instructive to note the total level of royalty payments made to indigenous peoples in other countries such as America. The current maximum Australian statutory royalty level of 4 per cent for uranium is dramatically different to the royalty level of 12 per cent paid to American Indian land owners. ... these agreements include other land-use payments. Although these royalty and income amounts cannot be directly translated into Australian State and Federal royalty and tax regimes, they speak clearly of a great disparity between financial arrangements made by Australian companies with indigenous peoples in Australia and in other countries.

- role of the NT Government in processing exploration applications

The Land Councils were critical of the NT Department of Mines' approach to and attitude towards a number of issues, including its role in processing ELAs. The CLC commented (sub. 38, p.11) that:

The NT Government appears to be guided by its ideological objection to Aboriginal land rights, rather than an interest in the smooth operation of the procedures.

and (p.12) that:

Despite the fact that many of the companies applying for mineral exploration licences are apparently only cursorily examined by the Department of Mines and Energy, the evidence from CLC records indicates that the Department, and the Minister, take an inordinately long time to give approval for companies to negotiate with the Land Council.

- exploration on land under claim

The NLC expressed concern at a new practice by the NT Department of Mines and Energy to issue exploration licences on land under claim, thus removing the (prospective) right of veto and right to compensation for damage done by exploration. The NLC suggested that there was a need for a policy whereby either exploration licences were not granted on such land, or there was a requirement that traditional Aboriginal owners have the right to negotiate fair and equitable terms and conditions for both the exploration and mining phase as soon as the land is granted.

-
- representation of traditional owners

The NLC considered that there were good reasons for setting up Land Councils to provide an interface between Aboriginal owners and companies, rather than having agreements struck directly between miners and local Aboriginal people. It contended (sub. 28, p.41) that:

It is also 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.

The NLC further suggested (sub. 28, p.41) that:

Bridging of language and cultural gaps through co-ordinated multi-disciplinary 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.

Some Aborigines, however, clearly felt that the existing processes (including having to be represented by Land Councils in any formal negotiations) did not give them the opportunity to put their view. Andy Andrews submitted (sub. 13) that:

We are continually being misrepresented by the NLC. ... We have no lawyers representing us, we have no white advisers. And the NLC and Sacred Sites Authority have the ear of the [Commonwealth] Government and media, we are not being given a fair go. I have written many letters to Mr Hawke and have just recently received a reply from Gerry Hand and Graham Richardson telling me the Jawoyns don't know what they are talking about, we and the NLC know what's good for the Jawoyn people.

The Aboriginal and Torres Strait Islander Commission stated (ATSIC, sub. 178, p.5) 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 Land Councils'.

The Commission's view and conclusions

The views presented above largely revolve around arguments as to the allocation of property rights - involving conflicting notions of equity or what is fair. 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 Aboriginal land (considered necessary to maintain the integrity of those rights) provides traditional Aboriginal owners with what effectively amounts to *de facto* control of any minerals on their land (subject to a national interest provision). 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.

- effectiveness of land rights legislation

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 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 concurs with the Northern Land Council (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 ATSIC contention (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, this Commission has examined the system from the point of view of the incentives provided by its basic features and the effects they have on the efficient use of resources.

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- the right of veto

A number of Government inquiries have studied this question (see Box 4.1) and concluded that the right of veto over what happens on and to their land is an essential part of Aboriginal 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 land on which houses have been built).

Although existing arrangements give Aborigines special rights over their land, these do not constitute 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 (eg Jabiluka) where Aborigines have given consent to mining or may be willing to do so (eg Koongarra) but government policy has prevented development going ahead. This effectively means that Aborigines do not have exclusive decision-making powers over their land. The Commission accepts that Aborigines should have a right to veto mineral development on their land. This right of veto should be subject only to the normal exercise of the national interest powers of the Parliament.

- once-only consent

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.

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)⁵ 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 those of developers (eg wishing to have at least some security of progressing to mining should exploration prove successful).

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.

⁵ 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 Aborigines but not on the mining company.

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- cancellation of ELAs

Under the current system, if a Land Council refuses to consent to an ELA, there is a ban on further applications for that land for five years, unless the Land Council or the Minister intervene. The original applicant is the only one who can reapply, unless they assign 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 (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 owners to deal with a company which meets their requirements.

Several participants argued against this proposal, claiming 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 (AMIC, sub. 229, p.25). 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 ELAs can re-apply for permission, 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 consent to access to any 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 ELA on 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

Another fundamental feature of the system is how traditional owners 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 Commission believes 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 desire 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 (ELA) made over an area that it not under the responsibility of an association (or other body expressly formed to represent traditional Aboriginal owners), then 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 Northern Land Council 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.

- distribution of royalty equivalents

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 Aborigines generally.

The Central Land Council has stated (sub. 193, p.11) that:

The intention of the distribution of monies under section 64 of *the Aboriginal 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 Central Land Council (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 share arrangements thus represent an impediment to the 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 the Aborigines on whose land mines are established.

Some participants (eg ATSIC) were concerned that Aborigines 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

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 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 for their functions/responsibilities (including identifying traditional owners of Aboriginal land and pursuing land claims) from the Commonwealth Budget.

- payment of royalty equivalents

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 Governments could be negotiated in the context of the Grants Commission process.

4.3 Situation in the States

This section provides a description of the current situation in each of the States with respect to Aboriginal land rights. It then records, where these were expressed in evidence to this inquiry, the views of the mining industry and Aboriginal groups. The Commission's views and conclusions with respect to the situation in States concludes this section.

South Australia

In 1966, the SA Government was the first Australian government to grant Aborigines title to land. The Aboriginal Lands Trust was established by the *Aboriginal Lands Trust Act 1966*. It was created to ensure title to existing Aboriginal reserves remained with Aborigines; to receive mineral royalty payments with which it could purchase more land; and to receive funds to enable development of the lands vested in the Trust.

Large areas of land, predominantly reserves, (totalling 486,000 square kilometres by 1980) were transferred to the Trust. The Trust leased the land back to the Aboriginal communities at nominal rates for 99 year, repeatedly renewable, periods.

Under the Act, the Trust is able, with the Minister's agreement, to sell, lease or mortgage the land vested in it. It may also develop the land, subject to the provisions of any Act relating to that land. The sale of land requires the consent of both Houses of Parliament.

Minerals on Trust land remain the property of the Crown, but the SA Government and the Trust have signed an agreement to the effect that the SA Government will pay the Trust an amount equal to all royalties it receives from mineral developments on Trust land. The Trust has agreed to pay 50 per cent of these royalties to the Aboriginal groups which live in, or have association with, the area being mined. Any moneys held by the Trust are to be used for the purchase of land or the development and improvement of Trust land.

In the *Aboriginal Land Trust Act 1966*, special provisions were made for the North West Reserve. This area could not be transferred to the Trust until a committee had reviewed the situation and approved such a move, due to the strong traditional and emotional relationship the inhabitants had with the area. Peterson (1981, p.120) comments that: "The Trust rightly believed that the people of the North West Reserve might be opposed to having their land *leased* back to them, no matter on what terms."

In 1975, the Minister advised the Trust that following consultations, he believed that the residents did now wish to have the Reserve incorporated into the Trust. Seven separate Pitjantjatjara communities grouped together to oppose the proposal, forming the Pitjantjatjara Council - membership of which stretched to WA and the NT. The Council lobbied the Premier, proposing a separate Land Trust for the North West Reserve. The Aboriginal Lands Trust was concerned that a dangerous precedent could be set if that option was accepted.

Following the recommendations of the Pitjantjatjara Land Rights Working Party, the *Pitjantjatjara Land Rights Act 1981* was passed.

The major political significance of this Act ... is that it is the first negotiated land rights settlement in Australia. ... The Act sets up a corporate body known as the Anangu Pitjantjatjara. The functions of this body are to establish the wishes and opinions of traditional owners in relationship to the management of their land and to seek, where practicable to give effect to them; to protect their interests in the land, to negotiate with people wanting to use or gain entry to the land, and to administer the land. (Peterson, p.121)

The North West Reserve and some adjacent land (some 100 000 square kilometres) was transferred to the Anangu Pitjantjatjara (AP). Although the land is held in fee simple, it cannot be sold or compulsorily acquired, resumed or forfeited, nor is land tax payable on it. All non-Pitjantjatjara people, except police, must apply for permission to enter the land. Prospective miners must first seek the approval of the Minister of Mines and Energy. If successful, they must then ask the AP, who have three options: unconditional permission; permission subject to conditions; or refusal. If the applicant feels aggrieved by the AP's decision or conditions, they may appeal to the Minister, who will appoint an arbitrator (cleared by the AP). The arbitrator's decision is binding on all parties, including the Crown.

Statutory mineral royalties are paid into a fund maintained by the Minister for Mines and Energy. These funds are divided evenly into three parts and distributed to the AP, the Minister for Aboriginal Affairs for the benefit of SA Aborigines generally, and a to general State revenue. The AP can negotiate royalty payments with the companies above the statutory levels, but these must seem proportional to the disturbance caused to the people and land.

In 1984, similar legislation provided for Aboriginal ownership of some 76 000 square kilometres of Maralinga lands.

It is interesting to note that:

The legislation creates no land claims procedures. The consequence of this is that, at present, Aborigines in the State have no right to, and no right to apply for, additional land. Whether further land is granted to Aborigines will depend entirely on the policy of the government of the day. (McNamara 1986)

The State government was recently considering appropriate action following the report of a review of the *Aboriginal Lands Trust Act 1966*.

Views of the mining industry

In response to the Commission's draft report, AMIC commented (sub. 229, p.25) that "the report should have focussed on the reasons for access problems in South Australia, not just the Northern Territory, given the large proportion of that State to which exploration access is effectively denied."

New South Wales

In NSW, 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, the small area of Aboriginal land in the State (0.06 per cent)

and the fact that NSW is considered to have already been largely explored for minerals has meant that resolving conflicts between Aboriginal land rights and mining interests has not been a major issue.

Aboriginal views

The NSW *Aboriginal Land Rights Act 1983* provides for transfer of the mineral rights to Aboriginal ownership of any claimed land, excepting gold, silver, coal and petroleum. Control over exploration and mining for all other minerals on Aboriginal land in the State is vested in the Local, Regional and NSW Land Councils. The NSW Aboriginal Land Council commented (sub. 86, p.7) that these exemptions are significant, given "... coal is NSW's primary mineral. Also exempt are mining authorities, permits or licences that were in force before the land became Aboriginal land under the Act." This is also significant, because (p.5) "Almost without exception, any mineral prospects [in the State] have been located and licensed."

Although acknowledging their unique position with respect to mineral ownership, the NSW Aboriginal Land Council considered it inequitable that coal, gold, silver and petroleum were exempted. Moreover, the Council considered that little provision for protection of Aboriginal interests existed for lands not vested in Aboriginal Lands Councils, citing the adverse effects of the Baryulgil asbestos mine - through health risks to workers, the creation of an environmental hazard, and subsequent disruption to the community when relocation was required - as an example of where the needs of Aboriginal communities were not met.

Queensland

Legislation passed in 1982 allowed Aboriginal community councils on reserves to gain Deeds of Grant in Trust over reserve lands. This legislation was strengthened by the *Aborigines and Torres Strait Islanders (Land Holding)* Act in 1985. The Act provides for individual ownership of trust areas for residential or commercial use.

In a 1989 pre-election policy statement, the Labor Party proposed granting inalienable freehold title to trust areas and royalty payments from mining on Aboriginal reserves. These proposals are yet to be implemented.

Aboriginal views

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 Aboriginal Co-ordinating Council (sub. 36) also said that Aboriginal groups and communities in Queensland had not received satisfactory protection from mining activities on their land. The Council called for changes in the recognition of Aboriginal rights via extensive amendments to the

Mineral Resources Act 1989 to cater for the rights of veto and requirements to consent by Aboriginal and other landowners throughout Queensland. It suggested that the effects on the mining industry of such reforms, by forcing mining companies to negotiate with Aborigines, would be:

... a more committed involvement in social, cultural and environmental compensation both financially and morally and will require a more determined effort on their behalf to come to suitable agreements through negotiations with Aboriginal communities and people in Queensland.

The Tharpuntoo Legal Service Aboriginal Corporation believes (Tharpuntoo, sub. 188, p.13) that the current situation in Queensland means that "Aboriginal consent is virtually irrelevant to most current projects in Cape York", but note (p.4) that:

[Mining companies] generally make an attempt to secure the approval of the Aboriginal people concerned - or whom they perceive to be concerned. Unfortunately mining company staff - and staff of many government departments - are ill-equipped to carry out such consultation, not only because of a lack of knowledge of Aboriginal culture, but also due to their position vis-a-vis the community and the complex relations of domination and power which exist between the two. ... Equally, Aboriginal communities in Cape York are ill-equipped to enter into such negotiations due to the lack of legislated and suitably funded bodies capable of representing their interests.

Tharpuntoo commented (sub. 188, p.3) that:

Recent conflicts between Aboriginal communities and mining companies in Cape York Peninsula may be attributed to the absence of any structured framework for negotiation and the structural disadvantage of Aboriginal people in their negotiations with miners, rather than opposition to mining per se.

and concluded (pp. 12-13) by saying:

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. Thus some projects currently going ahead in spite of Aboriginal opposition may go ahead with Aboriginal support while others may be retarded or prevented. This may perhaps result in a net increase in mining and development activity but it could also lead to a decline, accompanied in either case by a vast improvement in the quality of relations between the industries concerned and Aboriginal communities.

Western Australia

The WA Aboriginal Affairs Planning Authority described (sub. 201) the WA situation as follows:

Government policy since 1986 emphasizes the provision of 99 year leases to Aboriginal communities resident on Aboriginal lands or responsible for any particular project taking place on that land. Access for mining and exploration necessarily requires the agreement of the Ministers for Mines and Aboriginal Affairs. The Minister for Mines has the power to issue a licence or lease under the Mining Act against the recommendation of the Minister for Aboriginal Affairs, but the latter retains control over entry. Aboriginal groups hold a central role in the decision making process through the consultation requirements of the AAPA Act, and their legal standing created by the issuing of a 99 year lease. Although consultation is required with Aboriginal people, and the Aboriginal Lands Trust must recommend in accordance with the Aboriginal communities' wishes, there is no power of veto on the part of those Aboriginal land holders. [On Aboriginal reserves] an entry authority issued for exploration purposes does not create any right of renewal for subsequent mining. Any statutory fees and royalties paid to the WA Treasury for mining and exploration on Aboriginal land are paid to the Aboriginal Lands Trust according to a complex formula [basically payments up to \$100 000 are fully paid to the Trust, while for payments exceeding that figure, \$100 000 plus a percentage of the excess, which decreases as the excess increases, is paid to the Trust].

Views of the mining industry

The Association of Mining and Exploration Companies (AMEC) expressed concern at the situation in Western Australia where, although minerals on reserves set aside for the use and benefit of Aborigines belong to the Crown, titles to explore for and to develop these resources require the consent of the landholders. AMEC considered that this gave the Aboriginal owners *de facto* ownership of minerals and veto over exploration and mining. AMEC claimed (sub. 15, p.29) that "irrespective of whether these negotiations are successful, they are enormously expensive in terms of time and resource, for companies wishing to explore this category of land."

Stockdale described (sub. 43, p.3) its experience of delays in gaining approval for access to Aboriginal reserves in Western Australia:

It has taken us 3 years to gain access for exploration in the Forrest River Aboriginal Reserve from the time that the community indicated its agreement to the continuation of period of exploration which had run every year from 1980 to 1986. ... we tried for several years in the early 1980s to gain access to Jigalong Aboriginal Reserve. Again in the Jigalong application, the Aborigines themselves had agreed to Stockdale working in the Reserve but the [WA] Aboriginal Affairs Department was unable to convert the Aborigines' agreement to formal consent under the Aboriginal Affairs Planning Authority Act.

Aboriginal views

The WA Aboriginal Affairs Planning Authority raised (sub. 201) a number of concerns, including:

- It is inaccurate for mining companies to argue that access is prevented by Government Aboriginal Affairs agencies. Companies do not have either the skills or the objectivity to assess whether there is support from Aborigines for a particular exploration program. To speak of a whole community being in agreement, as Stockdale asserted in the Forrest River example, is to overlook the complexities of Aboriginal relationships to land;
- Aboriginal communities in WA living on Aboriginal land the subject of mining interest generally hold the view that any royalties should be payable directly to them;
- While this is a reasonable view the AAPA and the Aboriginal Lands Trust is keen to ensure that the benefits are spread more widely. There are some communities without a large land base, but which are manifestly affected by mining (eg Aboriginal fringe dwellers in Kalgoorlie); and
- Since the power of veto over mining does not rest with Aboriginal communities, direct negotiations between communities and miners would be a somewhat one sided affair.

The Aboriginal Legal Service of WA is concerned that:

- (Transcript, p.1997) the AAPA does not adequately determine the wishes of the communities because there has been a lot of communication problems between the Minister for Aboriginal Affairs and the Aboriginal community, and the whole process is only as good as the consultation that goes on between the AAPA and the Aboriginal community. In a lot of cases all that communication represents is a letter from the AAPA to the Aboriginal community. Often that letter is simply misplaced or lost and then there might be a follow-up in 12 months time. When a response is given to that letter then that is basically in a lot of cases all that ends up going back to the Minister for Aboriginal Affairs, so it is just a series of correspondence;
- (p.2008) mining companies prefer sacred site identification surveys, which locate all the sites on the relevant area. This method, they claim, runs contrary to Aboriginal culture, since the location and nature of sacred sites has to remain secret otherwise its significance is lost. They propose the adoption of 'work area clearance' - where the exploration/mining company submit a description of the area they wish to work in to the Aborigines, who can either clear the area as free of sites, or advise that they don't wish that area (or parts within) to be interfered with.

They proposed that:

- (Transcript, p.1995) 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;
- (p.1996) a process needs to be developed that identifies who are the right people to speak to, both in terms of traditional owners and custodians, but also a process that enables a mechanism for discussions to take place;
- (p.2002) there needs to be some degree of consistency in terms of formal guidelines so that everybody knows what the ground rules are and what their obligations are, and that Aboriginal people can know there is a process they can rely on if they have got some concerns about the development. That they are able to express - and able to assert - what they believe are their rights to defend or deny development occurring. They believe this would lead to greater efficiency within the mining industry;
- (p.2006) that a number of the problems now being experienced could be addressed by some form of legislation which requires negotiation between mining companies and Aboriginal communities and sets up a procedure where Aboriginal communities and groups can be notified about development of exploration or mining on their land.

Tasmania

In January 1989, the Tasmanian Government confirmed that it would not be introducing Aboriginal Land Rights legislation. It offered to protect sites of major significance to Aboriginal communities under the State's National Parks and Wildlife legislation.

Australian Capital Territory

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. This was the first land grant made under Commonwealth legislation outside the Northern Territory.

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 - 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 the enactment of a transparent process of negotiation).

The Commission believes that if the property rights of the various parties were more clearly defined, it 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.

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4A History of Aboriginal Land Rights in Australia

This attachment details the history of Aboriginal land rights in Australia from federation to the present day. It particularly focuses on the Northern Territory situation, but does provide some background on events in the other States and Territory. Its purpose is to provide a factual basis for much of the discussion of Aboriginal land rights elsewhere in this report.

4A.1 Background

When the Australian Constitution came into effect in 1901, responsibility for Aboriginal affairs was considered a matter purely for State Governments.

Section 51(xxvi) of the Constitution, in its original form, stated:

The Parliament shall, subject to this Constitution, have power to make laws ... with respect to ... the people of any race, *other than the aboriginal race in any State*, for whom it is deemed necessary to make special laws. (Emphasis added.)

A subsequent High Court interpretation of Section 51(26) ensured control over Aboriginal affairs remained with the States. Forrester, however, proposes that this "special laws" power was not, as it would appear to be, a provision through which beneficial laws could be enacted for minority groups. It was designed to allow the Commonwealth to introduce discriminatory legislation against foreigners in an attempt to deal with the perceived threat of excessive European influence in Australia.¹

The Commonwealth was fully responsible for the territories, however, and in 1910 it introduced the *Northern Territory Aboriginals Act*, followed by the *Aboriginals Ordinance* in 1918. One section of the latter specifically prohibited holders of miners' rights from entering Aboriginal reserves. This reflected the influence of the Special Commissioner and Chief Protector of Aborigines in the Territory, Baldwin Spencer, who strongly advocated a policy of preservation and protection of Aborigines. In 1939, the Mining Ordinance was passed. This prevented the granting of mining leases on NT Aboriginal reserves, doubly excluding miners from these reserves. Coupled with dramatic increases in the size of Aboriginal reserves in the NT between 1920 and 1940, this meant miners were excluded from a large part of the Territory.

In practice, however, this was not always the case. In 1932, gold was discovered in and around the Warramunga Aboriginal reserve near Tennant Creek. Miners exerted pressure for three years upon the NT Administrator to have the reserve revoked to allow gold mining to commence. In July 1935 the old reserve was revoked and a new Warramunga reserve was created on an area of vacant Crown land that was effectively useless to the Aborigines since it had no adequate water supply. The implications of this action were far reaching.

¹ For further explanation, see Forrester G. 1986, p.738.

... this revocation of a proclaimed reserve and the absence of compensation for Aborigines from the subsequent mining of gold had an important influence on policy decisions when the question of mining on Aboriginal reserves next arose in 1951 (Altman 1983, p.4).

In 1951, with responsibility for administration of the Northern Territory transferred to the new Department of Territories, there was a major shift in Aboriginal policy from preservation and protection to assimilation. It was now considered best for Aborigines to be completely incorporated into (white) Australian society. Altman (p.5) notes that:

The crucial point is that the policy swing to assimilation suddenly equated the welfare of Aborigines with the welfare of the whole Australian population, and conversely, what was good for Australia was good for Aborigines. The policy of protection had maintained as a central assumption the tenet that the establishment of (mining) towns adjacent to concentrations of Aboriginal population would have disastrous effects on those populations. With the change in policy, towns were viewed positively as a possible instrument of assimilationist policies.

With assimilation as the goal, mining on Aboriginal reserves could now be seen as having a positive impact through interaction and employment opportunities. The Northern Territory Administration pressured Federal Cabinet until they decided to allow mining on reserves, but only under a number of conditions: firstly, that mining proposals be subject to personal approval by the NT Administrator; secondly, that the ad valorem royalty rate of 1.25 per cent recommended by the NT be doubled to 2.5 per cent; and thirdly, that special conditions apply to the issue of mining leases on Aboriginal reserves that ensure reasonable protection of the Aborigines' interests and welfare.

These conditions implied that Cabinet believed the NT Administrator should only approve a small number of mines on Aboriginal reserves. Those mines allowed would need to have significant deposits and be highly profitable to be able to pay the increased royalty rate. The conditions reflected the fact that one of the important reasons behind Cabinet's decision was to further 'national interest', and small mining operations could not be regarded as satisfying this requirement.

In order to sell the idea to the public, the Government introduced two important innovations. Firstly, royalties extracted from mining on Aboriginal reserves were to be directed for the collective benefit of Aborigines in the NT. Secondly, a trust fund would be established where all such royalties were to be deposited. These royalty payments would be in addition to normal funding for Aboriginal welfare and as such would be a defence against possible public criticism of the decision to allow mining on the reserves. While assimilation was the main objective of Aboriginal policy, royalties were seen as rent for the use of land, since the minerals still belonged to the Crown. It was not until 1963 that the question of compensation for disruption of lifestyle arose.

As it happened, the first mine on an Aboriginal reserve in the NT did not commence operations until 1965.

In 1967 a referendum was held to amend the Constitution to give the Commonwealth Government the power (concurrently with the state governments) to legislate for Aboriginals and Torres Strait Islanders. Some 90 percent of Australians voted in favour of the amendment. Although the Commonwealth now had the power to legislate for Aborigines in the States, it appeared unwilling to encroach upon what had always been a State responsibility.

4A.2 Aboriginal Land Rights Legislation in the NT

The main event that encouraged the introduction of land rights legislation in the NT was the landmark court case *Milirrpum and others v. Nabalco and the Commonwealth*, in which Aborigines attempted to have mining at Gove halted by the Northern Territory Supreme Court in 1970. The Yirrkala Aborigines claimed that the Crown had no right to negotiate for the mining of Aboriginal land by Nabalco without the consent of Aborigines and without any direct compensation to traditional owners. Mr Justice Blackburn determined that according to Australian law as it stood, there was no communal native title to land. He decided that the Yirrkala clans had no proprietary rights to the land in the Gove area. The Yirrkala had achieved a moral victory, however, arousing public interest in the issue of Aboriginal land rights.

In response to this public interest, the Liberal-National Country Party Government, with the 1972 election looming, proposed giving Aborigines some title to land on reserves through general purpose leases. Whitlam, the leader of the Opposition at the time, promised that if Labor were elected, inalienable freehold and community ownership of land in perpetuity would be offered to the Northern Territory Aborigines. Following Labor's general election win in December 1972, there was a freeze on the granting of exploration licences on Aboriginal reserves in the NT. An Aboriginal Land Rights Commission, headed by Mr Justice Woodward was established to report on the appropriate means to recognise and establish the traditional rights and interests of the Aborigines in land in the Northern Territory.

Woodward presented two reports, one in 1973, the other in 1974. One of the recommendations of the first report was to establish Interim Land Councils to represent Aboriginal viewpoints before the Commissioner. These Land Councils argued that land rights were not complete without corresponding full mineral rights. The mining industry lobbied to restrict Aborigines to the same limited mineral rights as all other Australians. Woodward decided that minerals and petroleum on Aboriginal land should remain the property of the Crown. He did, however, accept that denying Aborigines the right to prevent exploration on their land would be to deny them the reality of land rights. He recommended that Aborigines have the power of veto over exploration on their land - but with two limitations: firstly that the veto could be overridden by the government in a case where 'national interest' required such an action - this decision had to be approved by both Houses of Parliament; secondly, the power of veto applied only to exploration - there was no way Aborigines could prevent the mining phase of a project once they had permitted the proponents to explore.

This meant that miners would have to negotiate directly with the Aborigines for consent to mine on Aboriginal land, whereas before they had negotiated only with the Commonwealth or Northern Territory Administration. Woodward also recommended that the mining companies negotiate an appropriate level of royalty payment with the Aborigines. Forseeing possible bargaining/communication problems, Woodward recommended that regional land councils conduct all negotiations on behalf of the traditional owners.

With a principle of 'prior interest' in mind, Woodward suggested that mining companies who held exploration licences over parts of Aboriginal land prior to the 1972 freeze on exploration licence grants would not be subject to Aboriginal veto, although they would still be required to negotiate a compensatory agreement with the land council.

At a meeting of the Australian Aboriginal Affairs Council in 1973, Whitlam, the Prime Minister at the time, proposed that the Commonwealth take over State responsibilities in Aboriginal policy and planning. All States except Queensland accepted the offer and the Commonwealth Department of Aboriginal Affairs was established to be a central authority for policy administration.

However, when disputes concerning Aboriginal land rights arose, the Commonwealth Government still hesitated to override the States. Nieuwenhuysen (1980, p.13) proposes that:

... it may be that the apparent unwillingness of the Federal Government to override state governments rests on the practical consideration that all the basic services (health, education, police, general welfare, and so on) are provided by state government instrumentalities. Without assuming that they would continue to be provided by a state it would be difficult in practice for the Federal Government to guarantee their continuity.

Helped by lawyers employed by the Interim Northern Land Council, Woodward proposed drafting instructions for NT land rights legislation. The Whitlam government accepted the vast majority of the recommendations of the Commission and closely followed Woodward's drafting instructions in preparing the *Aboriginal Land (Northern Territory) Bill*. This bill was read once in Parliament in October 1975, but the double dissolution of Parliament in November of that year prevented it from progressing any further.

The Liberal-National Country Party coalition that was elected in December of 1975 had promised to pass the land rights legislation. The coalition's version, the *Aboriginal Land Rights (Northern Territory) Act 1976*, was passed on 9 December 1976.

4A.3 The Aboriginal Land Rights (Northern Territory) Act 1976

The Act was proclaimed on Australia Day, 26 January 1977, and contained provisions for:

- the creation of Aboriginal Land Trusts to hold title to Aboriginal land and the grant to these Land Trusts of inalienable freehold title to NT Aboriginal reserves and some other land;
- Land Councils to act as agents for the traditional owners with respect to land matters, and to negotiate terms and conditions of exploration and mining, with an independent arbitrator if agreement cannot be reached;

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- the Commonwealth to pay amounts equivalent to the mineral royalties it (or the NT Administration) received into the Aboriginals Benefit Trust Account (ABTA) from Consolidated Revenue. ABTA funds to be distributed in the following way; 40 per cent of the statutory royalties was to be divided on a proportional basis to the Land Councils as general funds, 30 per cent of the royalties received from each project was to be paid to the Land Council in whose district the mine was located and were intended for the community affected, and the residual (30 per cent) was divided between (i) payments to benefit NT Aborigines as a whole, (ii) payments to cover administrative costs of the Trust Account, and (iii) payments to assist Land Councils to cover their expenses if they were not able to do so from the other payments.

There were a number of important differences between the (Liberal-National Country party's) Act and the Labor Bill - which had more closely followed the recommendations of the Woodward Commission. The main differences were:

- The provisions allowing for land claims on the basis of need were deleted. The new Act restricted Aborigines to traditional land claims only, and required proof of traditional ownership in all claims except for existing reserves or Missions.
- The Aboriginal veto could be overridden by the Federal Cabinet, rather than the proposed requirement of consent by both Houses of Parliament.
- Statutory royalties were not channelled through the land councils, as Woodward had suggested, but into an Aboriginals Benefit Trust Account (ABTA). The Commonwealth agreed to pay ABTA amounts from Consolidated Revenue equal to any royalties received by the Commonwealth or the Northern Territory government in respect of a mining interest on Aboriginal land.
- The new Act left a range of matters, including the protection of sacred sites, control of entry onto Aboriginal land or waters and the designation of Aboriginal rights with respect to pastoral properties, to be determined by the NT Legislative Assembly through complementary legislation. The NT Assembly subsequently passed two Acts;
 - the *Aboriginal Land Act 1978*, which made it an offence for any non-Aboriginal to enter or remain upon Aboriginal land. A permit may be issued by the Land Council, the traditional owners or in some circumstances by the Minister. The NT Government can also declare the seas for two kilometres around Aboriginal land closed.
 - the *Aboriginal Sacred Sites Act 1978*, which established the Aboriginal Sacred Sites Authority, whose functions include the registering, evaluating, recording and protecting of sacred sites.

4A.4 Amendments to the Aboriginal Land Rights (Northern Territory) Act 1976

The Act has been amended numerous times since its proclamation in 1977.

In 1978, it was amended to introduce the recommendations of the Ranger Uranium Environmental Inquiry and to ensure that the process established by the Commonwealth would continue once the NT achieved self government.

The Act was amended in 1980 in response to disputes arising from the implementation of agreements made under the original Act. The ownership of minerals was clarified, as was access to 'public' roads.

In 1984, the Act was amended to appoint a second Aboriginal Land Commissioner to accelerate the process of determining the validity of land claims.

Following a review of the Act by Mr Justice Toohey in 1983, a series of amendments were introduced into Parliament in two separate Bills that were passed in 1987. The Department of Aboriginal Affairs (DAA) listed (1986-87, p.29) the main features of the amendments as:

- a modified 'veto' provision at the mining exploration stage, which will enable Aboriginals to protect areas of cultural significance;
- a requirement for Aboriginals to decide on exploration proposals within a limited time (usually 12 months). If Aboriginals reject an exploration proposal, then no further applications may be made for five years. If Aboriginals accept an exploration application then there can be no exercise of the "veto" for mining proposals arising from this exploration application;
- a requirement that disagreement over terms and conditions for exploration, or for a subsequent mining proposal, should be referred to an arbitrator who would have power to determine the matter;
- a cut-off date for the lodgement of land claims; and
- the exclusion from land available for claim of land set aside for a public purpose (including stock routes and stock reserves).

O'Faircheallaigh, in discussing these recent amendments, wrote (1988) that:

Aboriginal people have retained a right of veto over mineral development on their land through their ability to prevent exploration and so mining, but their position has been weakened in two important ways. First, they must now decide in principle whether to allow mining at a very early stage of the mineral development process, and consequently at a time when very little information is available on any potential mining project. Second, unless they reject exploration outright they may become subject to arbitration procedures whose outcome, however undesirable from their perspective, is binding on them but not on the mining company with which they are dealing. The only major gain for Aboriginal people is the guarantee that they can prevent further applications for exploration on their land for five years at a time, a significant consideration given their frequent complaints regarding the persistence of mining companies seeking access for exploration.

4A.5 National Aboriginal Land Rights Legislation

In February 1985, the Commonwealth released its *Preferred National Land Rights Model*. This paper contained proposals the Commonwealth suggested could form the basis of national Aboriginal land rights legislation.

The model's basic characteristics are:

- inalienable freehold title to Aboriginal land;
- all Aboriginal Reserves and missions available for direct grant;
- all vacant (unused and unallocated) crown land available for claim;
- claims could be made on the basis of traditional entitlement, historical association long-term occupation or use, and for certain specified purposes such as the needs of town campers;
- an independent tribunal to hear claims, taking the views of all affected parties into account, and making recommendations to Government for a final decision;
- all legitimate prior interests in land the subject of a grant would be protected;
- provision for the granting of 'living area' excisions from pastoral properties;
- Aborigines would be able to exercise control over who went on their land, but not to the extent of withholding consent to mineral exploration and development. They could argue against exploration at the independent tribunal, and negotiate terms and conditions;
- Aborigines would be entitled to compensation for damage or disturbance to their land through mining royalty equivalents, the proportion to be determined by the Government;
- the protection of sacred sites would primarily be a State responsibility, with a Commonwealth Authority to intervene if the States lack appropriate levels of protection. Declaration and protection of sacred sites would not be open to negotiation with respect to mining, exploration or any other activity, except in cases of national interest.

The Minister for Aboriginal Affairs at the time, Mr Holding, said it was intended that extensive consultation on the model would commence as soon as possible with State and Territory Governments, as well as Aboriginal, mining, rural and other interest groups. The proposed national legislation was intended to be capable of operating concurrently with compatible State legislation - adding rights to existing legislation where necessary and overriding them if they were incompatible.

The Government's model was not warmly received by Aborigines or the mining industry. The proposed guidelines for national legislation went too far for the mining industry and not far enough for Aborigines. The Government also encountered strong opposition to its model from a number of States, and consensus seemed improbable.

In March 1986, Mr Holding reaffirmed the Commonwealth's support for the principles contained in its 'Preferred National Land Rights Model', but announced that the Commonwealth would prefer land rights to be implemented by State initiatives consistent with those principles, rather than by overriding national legislation. This was seen as bowing to lobby pressure and the Opposition, although agreeing with the principle of a State approach, claimed the Government had failed to honour previous commitments.

However, as Forrester (1986, p.745) points out:

The present regime of Aboriginal land rights in Australia, while abhorrent to those who feel that only with the exercise of the Commonwealth's undoubted power to enact overriding national legislation will effective land rights be achieved, rests on solid constitutional grounds. The Australian constitutional structure permits the Commonwealth Government to enact land rights legislation for the Northern Territory, to negotiate with the States for State legislation furthering the objectives of the 'preferred model', and to wait in the wings with national land rights legislation should the various States' actions prove inadequate.

The Commonwealth Department of Aboriginal Affairs (DAA 1988-89, p.13) believes that a State-by-State approach to land rights is more appropriate than national legislation:

This approach acknowledges the different land needs of Aboriginal and Torres Strait Islander people in the different States and recognises the progress being made by State Governments towards the provision of secure land tenure for Aboriginal and Torres Strait Islander people.

4A.6 The Heritage Protection Act

The *Aboriginal and Torres Strait Islander Heritage Protection Act* (the Heritage Protection Act) was introduced in 1984 as interim legislation to complement existing Aboriginal legislation. It was to be a last resort for situations where State or Territory laws did not provide appropriate protection or preservation of significant Aboriginal areas and objects.

The Act gives the Minister, and authorised officers, power to intervene by way of a declaration. Where negotiations and mediation fail, a declaration may be used to preserve and protect the place, area or object for a specified period. The Act cannot be used to grant permanent forms of protection or to transfer title to the Crown or to Aboriginal applicants other than where the objects are Aboriginal remains and are accepted by Aboriginals with an interest in those remains.

During the period of a declaration, the Commonwealth will use the opportunity to negotiate for longer-standing arrangements, which may provide improved Aboriginal control and protection over significant places and areas (DAA 1986-87, p.30).

The Heritage Protection Act was amended in 1986 to remove the section relating to its expiry after two years.

Since 1986, the Commonwealth Government has been monitoring the progress of each State in improving the welfare of Aboriginal and Torres Strait Islander people, using the Heritage Protection Act when the level of protection offered is not considered satisfactory. The introduction of national land rights legislation is off the Commonwealth agenda for the time being.

4A.7 State Aboriginal Land Rights Legislation

In the absence of Commonwealth legislation, various States have introduced measures to secure land for Aboriginal communities:

South Australia

The SA case is interesting since it is often proposed as a better system than that of the NT.

In 1966, the SA Government was the first Australian government to attempt to grant Aborigines title to land. The Aboriginal Lands Trust was established by the *Aboriginal Lands Trust Act 1966*. It was created to ensure title to existing Aboriginal reserves remained with Aborigines; to receive mineral royalty payments with which it could purchase more land; and to receive funds to enable development of the lands vested in the Trust.

Large areas of land, predominantly reserves, (totalling 486 000 square kilometres by 1980) were transferred to the Trust. The Trust leased the land back to the Aboriginal communities at nominal rates for 99 year, repeatedly renewable, periods.

Under the Act, the Trust is able, with the Minister's agreement, to sell, lease or mortgage the land vested in it. It may also develop the land, subject to the provisions of any Act relating to that land. The sale of land requires the consent of both Houses of Parliament.

Minerals on Trust land remain the property of the Crown, but the SA Government and the Trust have signed an agreement to the effect that the SA Government will pay the Trust an amount equal to all royalties it receives from mineral developments on Trust land. The Trust has agreed to pay 50 per cent of these royalties to the Aboriginal groups which live in, or have association with, the area being mined. Any moneys held by the Trust are to be used for the purchase of land or the development and improvement of Trust land.

In the *Aboriginal Land Trust Act 1966*, special provisions were made for the North West Reserve. This area could not be transferred to the Trust until a committee had reviewed the situation and approved such a move, due to the strong traditional and emotional relationship the inhabitants had with the area. Peterson (1981, p.120) comments that: "The Trust rightly believed that the people of the North West Reserve might be opposed to having their land leased back to them, no matter on what terms."

In 1975, the Minister advised the Trust that following consultations, he believed that the residents did now wish to have the Reserve incorporated into the Trust. Seven separate Pitjantjatjara communities grouped together to oppose the proposal, forming the Pitjantjatjara Council - membership of which stretched to WA and the NT. The Council lobbied the Premier, proposing a separate Land Trust for the North West Reserve. The Aboriginal Lands Trust was concerned that a dangerous precedent could be set if that option was accepted.

Following the recommendations of the Pitjantjatjara Land Rights Working Party, the *Pitjantjatjara Land Rights Act 1981* was passed.

The major political significance of this Act ... is that it is the first negotiated land rights settlement in Australia. ... The Act sets up a corporate body known as the Anangu Pitjantjatjaraku. The functions of this body are to establish the wishes and opinions of traditional owners in relationship to the management of their land and to seek, where practicable to give effect to them; to protect their interests in the land, to negotiate with people wanting to use or gain entry to the land, and to administer the land (Peterson, p.121).

The North West Reserve and some adjacent land (some 100 000 square kilometres) was transferred to the Anangu Pitjantjatjaraku (AP). Although the land is held in fee simple, it cannot be sold or compulsorily acquired, resumed or forfeited, nor is land tax payable on it. All non-Pitjantjatjara people, except police, must apply for permission to enter the land. Prospective miners must first seek the approval of the Minister of Mines and Energy. If successful, they must then ask the AP, who have three options: unconditional permission; permission subject to conditions; or refusal. If the applicant feels aggrieved by the AP's decision or conditions, they may appeal to the Minister, who will appoint an arbitrator (cleared by the AP). The arbitrator's decision is binding on all parties, including the Crown.

Statutory mineral royalties are paid into a fund maintained by the Minister for Mines and Energy. These funds are divided evenly into three parts and distributed to the AP, the Minister for Aboriginal Affairs for the benefit of SA Aborigines generally, and to general State revenue. The AP can negotiate royalty payments with the companies above the statutory levels, but these must seem proportional to the disturbance caused to the people and land.

In 1984, similar legislation provided for Aboriginal ownership of some 76 000 square kilometres of Maralinga lands.

The State government was recently considering appropriate action following the report of a review of the *Aboriginal Lands Trust Act 1966*.

New South Wales

Following the recommendations of the Select Committee Report Upon Aborigines in 1980, the *NSW Aboriginal Land Rights Act* was passed in 1983.

The Act established a three-tier Aboriginal land council structure, involving local and regional councils and the NSW Aboriginal Land Council.

7.5 per cent of the State land tax receipts for the 15 years between 1984 and 1998 (about \$15m per year) are to be paid into a fund. Half of these funds are to be invested to support the land councils in the future and to enable them to purchase land after 1998. The remainder can be used now by land councils to purchase land and to cover administrative costs.

The NSW Aboriginal Land Council (1986-87, p.6) believe that Aborigines in the State have difficulties claiming land:

Under the Act, Aboriginal land ownership is made possible through claims to vacant Crown lands which are not needed, or likely to be needed, for essential public purpose or residential use. Contrary to community perceptions, land cannot be claimed because of historical association. Moreover, the scarcity of vacant crown land in NSW has meant Kooris are restricted in what can be claimed.

Victoria

In 1986, the State Government introduced a bill to grant freehold title over the Framlingham Forest and a former reserve at Lake Condah to the local Aboriginal communities. The Opposition agreed to pass the bill only if substantial changes were made. The proposed changes were unacceptable to the Government, so they asked the Commonwealth to enact the legislation on behalf of the State. In May 1987, the Commonwealth passed the *Aboriginal Land (Lake Condah and Framlingham Forest) Act*. This provided for the granting of 11.5 square kilometres to the Aboriginal communities.

Western Australia

The *Aboriginal Affairs Planning Authority Act* was passed in 1972, establishing a Planning Authority, a Land Trust and other advisory bodies. The Act was amended in 1973 to merge the Planning Authority into the Commonwealth Department of Aboriginal Affairs. This arrangement remained until 1984, when the two bodies formally separated.

In 1984, a Commissioner was appointed to report to the WA Government on the issue of land tenure and title to Aboriginal people in WA. In September of that year, the WA Government released the Commissioner's report, along with its response - a proposed Aboriginal Land Bill. The Bill was strongly debated in both Houses of Parliament and finally defeated in April 1985.

The Commonwealth and WA governments agreed in 1986 to commence the Aboriginal Communities Development Program. Over a five year period beginning in 1986/87, \$100 million is to be jointly provided. The program provides for grants of long term leases over existing Aboriginal reserves, along with provision of housing and essential services to newly tenured communities.

Tasmania

In January 1989, the Tasmanian Government confirmed that it would not be introducing Aboriginal Land Rights legislation. It offered to protect sites of major significance to Aboriginal communities under the State's National Parks and Wildlife legislation.

Queensland

Legislation passed in 1982 allowed Aboriginal community councils on reserves to gain Deeds of Grant in Trust over reserve lands. This legislation was strengthened by the *Aborigines and Torres Strait Islanders (Land Holding) Act* in 1985. The Act provides for individual ownership of trust areas for residential or commercial use.

In a 1989 pre-election policy statement, the Goss led Labor Party proposed granting inalienable freehold title to trust areas and royalty payments from mining on Aboriginal reserves. We are yet to see these proposals implemented.

ACT (Jervis Bay)

The Commonwealth passed the *Aboriginal Land Grant (Jervis Bay Territory) Act* in 1986. Under this Act, 403 hectares of land at Jervis Bay was granted to the local Aboriginal community in 1987. This was the first land grant made under Commonwealth legislation outside the NT.

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5 PRIVATE RURAL AND URBAN LANDHOLDERS

The Commission received considerable evidence of conflicts between exploration/mining interests and private rural and urban landholders. These conflicts tended to focus on the extent of landholders' power of veto, compensation payable for damage caused by mining or exploration, prior notice intended activities and what these may involve and the adequacy of 'buffer zones' protecting landholders from mining development. These problems seem to reflect failures in the way in which property rights are specified or can be exercised. While combining mineral and land ownership would, in principle, solve many of the problems, legislative reform spelling out consultative processes to be followed and codes of conduct (perhaps using the NSW arrangements as a model) could be usefully pursued.

A major area of conflict between the rights of landholders and the rights of companies to exploit mineral resources belonging to the community relates to pastoral or other agricultural land. Conflicts have also arisen between miners and urban landholders. This section illustrates some of the problems that have arisen, identifies their underlying causes, and examines possible means of their resolution.

5.1 Rural land conflicts

The legal position for adjudicating between the rights of private landholders and the rights of explorers or developers varies considerably between the States and according to the categorisation of land. For example, in Western Australia, owners of private rural land (but not pastoral land) can veto both exploration and mining on their land. Such a right of veto is, however, an exception to the general rule. Other exceptions occur in respect of certain types of land - particularly in relation to improvements and developments on agricultural land and on land classified as orchards, vineyards etc. The general position, however, is that farmers have no right to veto exploration or mining but are entitled to compensation for loss suffered as a consequence of the granting of an exploration or mining lease. Both mining and rural interests have argued that existing legislation is inadequate and does not allow for the best use to be made of both mineral and rural land resources.

The mining industry view

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, the Association of Mining & Exploration Companies (AMEC, sub. 15, p.25) claimed that the conditions for land access under the WA Mining Act:

... have delivered into the hands of the Private Landholder, for all practical purposes, an effective 'veto'; the private landholder must agree in writing that the Mineral Exploration or Mining company may enter his land and a Compensation Agreement must be concluded before any operations begin; these provisions allow an infinite variety of tactics to be effectively employed by private landholders wishing to prevent mineral exploration programmes from proceeding; and the Agricultural community which holds the greatest proportion of the alienated land, had 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.

The landholder view

Farmers, 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. It has been claimed, for example, that "mining companies often devastated farming land, caused stock losses and left mining operations on properties for years, preventing the owner from selling his property" (*Australian Rural Times*, 19 October 1989, p.47). Even AMIC has conceded (Wheatley 1989, p.9) that:

... it's no secret there are unpleasant stories of companies rampaging over private rural land with little regard for the primary producer, creating considerable environmental damage. There are cases of primary producers going to the wall because of mining on their land, of bitter confrontations between farmers and miners, and of inadequate legislation and painfully slow resolutions of conflict, amid communication breakdown on both sides.

The Commission received anecdotal evidence of some of these conflicts (see Box 5.1 and 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 developments or improvements on private land (eg buildings, land under cultivation etc) from mining by insufficient protective distances specified in legislation.

Western Mining Corporation (WMC) - a company involved in some of the alleged incidents - strongly disputed particular accusations, maintaining that all its actions complied with the Queensland Mining Act and that in many instances it has altered plans at considerable expense to accommodate complaints. It also disputed the landholder's version of events (sub. 159). For example, WMC claimed that it had offered to remove the survey pegs at the completion of the planned work programme for 1989, but that the landholder had preferred WMC to leave them.

Box 5.1: `Disneyland on the farm'

The Landholders Association recounted incidents of interference to stock and property management by a large mining interest commencing in 1987. These included:

- refusal by the company to co-ordinate surveys with the landowner's muster programme;
- the conducting of an aerial survey without prior notice allegedly resulting in distress and damage to stock (eg aborted calves) and damage to property;
- without prior notice of the specific area or intended work, the undertaking of a grid-pattern survey in a breeding paddock where:

"The whole area looked like Disneyland gone mad. Shining steel fence droppers and thousands and thousands of pieces of flagging tape wherever you looked.

The flagging tape must certainly be damaging to cattle if ingested - and they do eat it readily. The steel pegs formed as lethal a mine field as ever horseman or beast could enter. Lord knows how many bulls at \$5000 a piece those pegs could cripple or maim - and should a horseman fall on one it would most likely be fatal.

In reply to my protests about the tape and pegs the mining company said "those were their normal devices for exploration" - hard luck for the horseman or beast impaled ...

The mining company reminded me that `self inflicted damages were not compensable', also that they had `unqualified right of access to my land with me not having the right to `dictate' conditions of entry'."

- difficulties in securing compensation from the company after the event.

Source: The Landholders Association (sub. 8)

Without wishing to get into a detailed debate about the rights or wrongs of this particular case (or the cases cited in Volume 4), it does suggest that there are problems with existing mechanisms for adjudicating between the rights of landholders and explorers/miners.

5.2 Urban land conflicts

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. Mr Denovan considered that:

The very concept of *any person* being able to apply for and be granted mining claims within metres of homes in an established residential area is the most amazing example of administration gone mad. There is absolutely no protection for the investment of either the residents of an area or the investment of the local authority operating in that area which rates residents and uses State funding to provide facilities which are destroyed by someone calling himself a miner ... The intention of the Queensland Mines Department to allow mining to within 100 metres of home under the Mineral Resources Act 1989, denies every resident of Queensland reasonable and fair protection ...

The Bolton Point-Marmong Point Progress Association (sub. 47) also highlighted conflicts involving mining in respect of the City of Lake Macquarie which they believed to be the first large scale urban area to be subjected to longwall underground mining in Australia. The Association contended that current legislation (NSW Coal Mining Act) has "become outdated by the introduction of new high extraction rate technologies which deliberately impact on the surface in a known and planned way and cause property and environmental damage." It noted that during the Inquiry into Longwall Mining of Young Wallsend Seam, BHP Steel International Group Collieries Division had claimed that the existing legislation:

contemplates that mining under urban land will be approved, that such mining may cause some damage to surface structures, that the procedures will limit damage to an acceptable level, and the residents will be compensated for any such damage. A policy that some damage is tolerable in the interests of coal extraction is inherent in the code.

The Association considered that this interpretation of the law, if correct, "is intolerable and in contravention of the democratic rights of private property holders." It further complained that "the definition of what damage is 'acceptable' or not 'acceptable' is determined by the industry and the Department of Mineral Resources and not by the home owners whose property is damaged." The Association also argued that no provision existed for private landowners or others to have an input into decisions on mining affecting land surface after a lease has been approved.

5.3 Underlying causes and possible solutions

In the Commission's view, land use conflicts between miners and private landholders reflect problems with the way property rights to land and minerals are specified. As discussed in Attachment 2A, well-defined property rights to an asset (eg land) - comprising the right to exploit it, to appropriate the associated returns, and to transfer these rights to others - provide strong incentives for individuals to ensure assets are put to their most productive use.

Property rights to rural or urban land and minerals on or under that land are poorly defined or overlap. Under common law, private landowners/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).

This combination of property rights can result in conflicts and also in inefficient use being made of society's scarce 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 is inefficient from the community's point of view because it may 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.

This suggests that the solution to these land-use conflicts is to specify property rights so that the costs and benefits of individuals' actions are taken into account in their decision-making. The following discussion examines some ways in which this might be effected.

Vesting mineral rights with landowners

One way of addressing the problem would be to vest rights to minerals with the owner of the land. As discussed in Section 2, if owners had full rights to minerals on their land, they would have strong incentives to make decisions based on maximising the value of both their land and any minerals it might contain. This in turn would ensure that the land is devoted to whichever use - mining or farming - generates the most wealth to society.

Such an ownership regime would present some problems, however. The most obvious, perhaps, is that it would represent a substantial redistribution of wealth within society - from the community as a whole to private landowners - and as such raises important questions of equity (see Section 2). Moreover, the postulated gains in efficiency from tying mineral ownership to ownership of the land above may be substantially reduced if the costs of negotiating mutually beneficial outcomes is prohibitive (as might be the case, for example, for an explorer having to negotiate with a large number of landholders for access to land for initial exploration over a wide area).

Legislative reform

Given the equity concerns and the potentially high transactions costs which could occur under a system which combine mineral and land rights, there may be a case for imposing a general rule, particularly in regard to exploration. Indeed, this is effectively what happens under existing mining legislation. However, as evident from the foregoing discussion, there is some concern that existing legislation does not adequately take into account competing values. There would therefore seem to be a need to review existing legislation with a view to ensuring that as far as possible, it provides for the relative economic values of competing land uses to be brought to account.

The need for some review of existing legislation has been recognised by parties on both sides of the debate. For example, the Shell Company of Australia stated (Shell, sub. 66, p.19) that:

Over much of Australia, agricultural landholders have the ability to prevent exploration. Recent legislation passed, but not yet proclaimed, in Queensland addresses this situation as does draft legislation under review in NSW. Dealing with a plethora of farmers can be extremely time consuming and costly. A more efficient approach (as proposed in Queensland and NSW) would be to remove the power of veto from the landholder but to allow compensation to be determined by an independent arbitrator.

On the landholders' side, the Landholders Association stressed (sub. 8, pp.9-10) that it was :

... not opposed to mining as such - we fully recognise the social and economic importance of mining, however the social and economic importance of farming must be addressed adequately and fully. To date we believe this has not been done in all States, certainly not in Queensland.

Similarly, the Victorian Farmers Federation (VFF) suggested that, failing vestment of mineral rights in landowners, negotiating balance could be addressed by the provision of formal access agreements, adequate compensation and rehabilitation criteria, and appropriate dispute-resolution procedures. It considered that statutory referral in mining legislation to formal *pro-forma* access agreements would assist in addressing those issues of relevance in negotiating access.

Discussion now focuses on what would seem to be two important elements of legislative reform in this area: the provision of appropriate compensation; and the negotiation of standard formal access agreements.

Compensation

The issue of full compensation is clearly central to ensuring that all costs and benefits of land-use decisions are taken into account. The VFF considered (sub. 84, p.18) that:

If the cost of fully compensating the landowner is too high for the miner, then the miner should not be able to negotiate with an arbitrator to have the cost lowered ... If access is to be granted without landowners consent on the basis that it is in the interests of the community, then there must be a mechanism that decides whether the benefit to the community is significant to warrant imposing a loss on the landowner ... If a government authority can grant access to private land without the consent of the landowner then there must be provisions for which compensation agreement is made ... It should be the case that landowners are compensated so that the landowner is in an equivalent position with regards to tangible and intangible interests including before, during and after the exploration or mining activity ...

The VFF further suggested (sub. 84, p.20) that governments should underwrite compensation agreements:

After a mining application has been granted by the Minister, the landowner should not need to worry about the viability of the mining operation, the effect of the operation on his ability to earn income, or what state his property is going to be left after mining is finished. The Minister granting access should be fully responsible for any effects of mining on that land.

The onus should be on the Minister to ensure the applicant and his intentions are *bona fide*, and not the responsibility of the landowner. The costs of any mistakes as a result of granting the application should be shared across the whole community, rather than be borne by the owner of the land.

The Queensland Chamber of Mines supported introduction of security deposits, conceding that (sub. 74, p.24) that:

To date, the monetary requirements in Queensland have not been such as to deter explorers. In truth, the sum required has probably been insufficient in some cases. But under the new legislation, the Minister will now judge each application on its merits and in accordance with the programme proposed, stipulate the sum to be called up. Additional sums may now be called up at any time during the programme. This gives a much greater level of comfort for the landowner and should negate the risk of contractors walking away rather than meeting their commitments because it was the cheaper of the two. This has been a cause of valid complaint against the smaller, alluvial miners in North Queensland in the past few years.

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 working well.

Industry access agreements

In recent years there has been growing recognition, from both farmers and explorers/miners, that existing arrangements were/are unsatisfactory. This has led to negotiations in various States between mining and farming groups aimed at developing a better system, in conjunction with reviews of outdated State mining legislation. Progress down this track appears to vary widely between States.

One State where the relevant legislation has been amended in concert with new agreements between farmers and miners on rural land access is New South Wales (see Volume 4, 'Examples of conflict between explorers/miners and private rural and urban landholders'). Under the old legislation, farmers had an absolute right of veto over exploration on any land classified as 'agricultural'. Equally, however, land falling outside this classification could be accessed by miners without regard to the rights of landowners. As noted by the NSW Minister for Natural Resources (NSW Parliament 1989), "the denial of access to land solely by its classification as agricultural land has meant a cumbersome system which does not maximize the benefits to the landholder, explorer, or the State."

The new legislation removes the right of veto, making all land available for exploration provided agreement has been reached between landholder and miner. If such agreement cannot be reached,

the matter is referred to an independent arbitrator from a panel agreed to by both the NSW Farmers' Association and the NSW Chamber of Mines, Metals and Extractive Industries. However, an important feature of the new arrangements is their intent to rely on non-legalistic means of resolving disputes. Complementary to the new legislation is a *pro-forma* agreement form and a code of conduct which sets out detailed guidelines on matters such as the movement of people and equipment on land, responsibilities for the environment, disturbance to stock and crops and land and precautions to be taken to minimise the risk of introducing infectious diseases or noxious weeds. In essence:

... the establishment of the code itself is regarded as a recognition by explorers that they are guests on private land and should operate with understanding of and sensitivity to the landholder, and appreciation by farmers of the needs and rights of mineral explorers in the search for minerals, most of which are owned by the Crown (NSW Chamber of Mines, Metals & Extractive Industries 1989).

Whilst the code of conduct and *pro-forma* access agreements are voluntary, if a negotiated agreement refers to the code, it becomes an integral part of that contract under common law. Success of the legislative changes in improving land access many therefore depend on widespread adoption of the code. This is because it is the clearer definition of property rights which underlies the solution to the problem of allocating resources to competing uses. In introducing the associated legislative changes, the Minister stated that a major advantage of the package is that "both explorers and farmers will know exactly where they stand [so that] the explorer becomes able to negotiate an agreement with the landowners and occupiers" (NSW Parliament 1989). Moreover, the costs of possibly having to negotiate a unique contract with several parties can be avoided or substantially reduced by relying on the general code of conduct (which individual farmers and miners know has been negotiated on their behalf). The role of State and Territory governments in the process would then be as a facilitator of negotiations and as an enforcer of property rights.

The NSW arrangements have already been held up as a model for other states to consider and have generally been endorsed by both farmer and mining organisations. A typical comment was that of Dominion Mining Ltd (sub. 9, p.2), which stated that the discussions between the NSW Chamber of Mines and the NSW Farmers Association had led to "a framework fair and equitable to both parties and such moves should be applauded."

The position in other States seems less satisfactory. Submissions to this inquiry by mining interests expressed particular dissatisfaction with the situation in Western Australia, Queensland and Victoria (see Volume 4, 'Examples of conflict between explorers/Miners and private rural and urban landholders'). However, the Landholders Association noted that a similar arrangement to the NSW agreement is now being negotiated in Victoria. A landholder information booklet and a Code of Conduct have already been produced by the Victorian Chamber of Mines in collaboration with the Victorian Farmers Federation. The Commission understands that an agreement between the pastoral and mining industries in Western Australia of a code of conduct for mineral exploration on pastoral land is pending.

As evident from the examples presented in this section, rural interests focussed their concern on Queensland. The revised Queensland Minerals Resources Act 1989 attracted criticism from landholder groups whose main complaint related to the distance of buffer zone protection. The Queensland Government (sub. 55, p.12) noted, however, that the new Mineral Resources Act was assented to after "more than two years of consultation and negotiation between Government, the mining industry and representatives of other affected parties particularly the major rural organisations." It also noted, however, that "further consultations between representatives nominated by rural/landholders, mining and local government organisations are being held to consider matters raised in the context of the new Act."

Little comment on the situation in Tasmania, South Australia, or the Northern Territory was made in submissions to this inquiry. The Commission understands, however, that in the NT, all improvements and developments are protected from mining with the practice of prior arrangement of access agreements. In South Australia all improvement and development is protected on all land, again with the practice of an access agreement and compensation arranged prior to entry.

5.4 Conclusions

Existing conflicts arising between explorers/miners and private rural and urban landholders reflect problems with the specification of rights to land and minerals. Combining mineral and land ownership would, in principle, solve many of these problems although in practice may be less effective and is unlikely to be adopted. There would therefore seem to be a good case for reviewing existing legislative arrangements in conjunction with affected parties where this has not already been done. The arrangements now operating in NSW would seem to provide a useful model for other States/Territories to consider.

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6 PUBLIC LAND USE CONFLICTS

In recent years, 'development versus conservation' debates have tended to escalate. Exploration and mining have often been at the forefront of these debates. Existing mechanisms for resolving resource-use conflicts have proved inadequate - as evidenced by the Coronation Hill experience. There is an urgent need to institute decision-making mechanisms which allow for the relative costs and benefits of alternative land uses to be compared so that the community receives the maximum benefit from its natural resources. There is considerable scope for utilising market-based approaches to this end. Where some government intervention is considered warranted, it is important that this goes beyond a commitment to concepts (eg sustainable development) to practical policies which allow for such an evaluation to take place.

Previous sections have considered two types of land use conflicts involving exploration and mining: Aboriginal use, and private rural or urban land use. These conflicts essentially represent conflicts between clearly identifiable individuals or groups with direct interests in the land in dispute. A third major land use conflict involving the mining industry involves areas of land with wider public interest: where, for example, conservation, preservation, or recreation are seen as important uses. Is mining and exploration necessarily in conflict with these uses? If they are, how can potential conflicts in land use be resolved in this broader context? What institutional arrangements can most effectively secure the end goal: that resources are used in the best interests of society as a whole?

6.1 Is exploration and mining necessarily in conflict with other public uses?

Exploration

The Commission received conflicting evidence on the extent to which mineral exploration threatened public uses for land such as conservation and preservation. A number of participants echoed the views of Denison Australia (sub. 22, p.10) which claimed:

Mineral exploration is not a real use. It is a temporary visitation that in the vast majority of cases leaves negligible and even no evidence of its passage.

Other participants disputed these claims. 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.

A more detailed discussion of the possible environmental effects of exploration is at Section 7. That discussion suggests that the environmental disturbance caused by exploration varies considerably depending on the type of exploration activity being undertaken (eg drilling versus non-intrusive methods such as aerial surveys). Moreover, while exploration may detract somewhat

from other uses of a piece of land (eg by damaging some conservation values), it is only in limiting cases (eg particularly fragile environments or particularly damaging exploration techniques) that exploration on land will rule out completely public uses such as conservation.

Mining

Mining itself generally involves greater disturbance to the land surface than exploration and is therefore generally seen as posing greater 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 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.

Other participants did not see the issue in such stark terms. Stressing the generally localised effects of mining, many participants considered that incompatibility arose only in respect of small areas of land (eg the minesite) so that mining was possible, for example, in or near locations containing areas of high conservation value. For example, some participants argued that allowing mining in 'buffer' zones within national parks would provide an effective means of trading off nature values with mineral values (see Attachment 6A).

The extent to which mining is seen as compatible or incompatible with other public land uses may also be influenced by the time frame considered. For example, while mining may be incompatible with conservation or recreation in the short term due to disturbance to the land and the creation of unsightly features, this may not be so in the longer term once 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.

Other participants disputed the success of mining rehabilitation programs (see Section 7). Whilst 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 with the surrounding area. Even if it is not, it may be very compatible with a wide range of other public uses for post-mining land, which may have a higher value to the community than those associated with attempting to restore the environment as closely as possible to its original state. Some participants, (eg CSIRO sub. 61, p.20) even suggested that mining can increase land-use options, by providing infrastructure that then allows other developments to take place on completion of the project.

CRA 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 viable, cashew nuts, neem trees and pastures show some viability.

One participant, Lance Lawrence (sub. 78), considered that currently there was a lack of incentive for miners to rehabilitate, largely because of artificial legislative restrictions in the Northern Territory 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 (eg spillways and silt catchments) and use overburden removed in such a way as to progressively develop an agricultural venture. At Pine Creek, for example, considerable potential for growing mangoes on mining land exists, but has been frustrated by the lack of suitable tenure land. Providing miners the opportunity to establish long-term and multiple land-use applications (eg 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. The NSW Government also stated (sub. 52, p.39) that:

... post-mining land use may also provide social, commercial and environmental benefits that have not been fully taken advantage of. For example, land mined by open-cut methods is often suitable for subsequent use as sites for solid waste disposal.

The NSW Chamber of Mines (sub. 37, p.3) claimed that modern mining techniques can restore areas to either their previous condition or to another form of land use which suits community needs (eg playing fields or golf courses).

The foregoing discussion suggests that when mining development is being considered as one of several alternative uses, it should be recognised that it is not necessarily an 'either/or' decision in all cases. Usually, some sort of trade-off will be possible. In some cases, however, a choice will have to be made between mutually exclusive alternatives. Where trade-offs or choices must be made, there is a need for some mechanism to resolve potential conflicts.

6.2 Existing mechanisms for resolving conflicts

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. As noted by the NSW Government (sub. 52, p.38), "historically, at least until the middle of this century, mining interests in NSW were generally unhindered in gaining access to prospective land for exploration."

Many arguments by the mining industry implicitly assume that mining is the dominant 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.3)). However, as noted by the Conservation Council of NSW (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 argued that environment considerations should dominate decision-making. For example, the Total Environment Centre considered (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 the 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 have focussed exclusively or predominantly on only one side of the equation: ie have only taken environmental concerns into account or have taken only development considerations into account, with little real attempt to integrate the two into decision-making. Unfortunately, this appears to have happened in the past. In the words of 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..

In similar terms, Normandy Poseidon (sub. 11, p.11) stated that:

In theory, it is possible to balance concern for the environment with the development necessary for the good of the community. Unfortunately, when specific cases of mining development are considered, a section of the community loses sight of the possibility of a balanced approach and demands absolute environmental protection. The recent situation in relation to mining at Coronation Hill is an example of this. The extreme positions adopted by some 'environmentalists' coupled with their skills in using the democratic process to apply pressure to politicians does not necessarily result in responsible decision making.

The Coronation Hill experience (see Box 6.1 and Section 21 for a more detailed analysis of the events) was cited by many participants as an example of the failure of existing decision-making processes to resolve conservation/development conflicts.

Box 6.1: Coronation Hill

The Coronation Hill Joint Venture (CHJV), in its submission, detailed a range of problems which it considered had added significantly to costs and unnecessarily delayed the project. These included:

- the initial lack of a well-defined Federal Government policy for land use in the area and subsequently after a policy was established getting it implemented so that CHJV could carry out the necessary work; finally in October last year seeing this policy effectively overturned because of pressure from conservation groups;
- after the Federal government decided on the environmental impact statement (EIS) procedures to evaluate the environmental effects of the project and the CHJV satisfactorily completed the EIS, the Government discarded the procedures and referred the project to the Resource Assessment Commission (RAC) for inquiry on the basis of completely new issues;
- an inordinately large number of government departments and agencies have been involved with the project making the approval process lengthy and costly.

Source: Coronation Hill Joint Venture (sub. 27)

In light of its experiences, the Coronation Hill Joint Venture (CHJV) submitted that (sub. 27, p.1):

In Australia, consideration of the environment now dominates government decision making to such an extent that bringing new projects to development can be very lengthy, expensive and high risk. 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 much bitter public debate, there must be less contention that the processes for handling the issue were highly unsatisfactory. Coronation Hill is not an isolated example of the problems. Rather, it is symptomatic of the failure of existing institutional arrangements to deal adequately with these land-use conflicts. The Commission received evidence of many similar cases. For example, CRA considered (sub. 73, p.107) that the recent announcement during the election campaign that a coal mining and electric power station in the Mt Leseur area would not be permitted to go ahead to be even more arbitrary.

A common complaint was that of Denison Australia (sub. 22, p.5) which argued that:

The mining industry, along with other developers, are required by government and community to produce clear and competent accounting of the benefits and costs of any project. On the other hand, the closure of land to exploration is done without any accounting of geoscientific benefits and costs.

This lack of rational decision-making processes appears to have carried over to other areas of government decisions on land use affecting the mining industry. A common complaint was that national parks have been declared without proper assessment of their mineral potential (or even their nature value). This issue is addressed more fully in Attachment 6A. Similarly, it was claimed by many participants in this inquiry that the way in which Australian Heritage listings operate in practice effectively result in land-use decisions being made without any reference at all to the relative values of alternative uses - or without compensation paid to those suffering loss as a result of these decisions. Similar claims were made in respect of World Heritage listings. These topics are examined in Attachments 6B and 6C respectively.

A basic problem, then, is that present processes for resolving conflicts do not allow for an objective weighing 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.

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 foregone, ie the general contribution to material standard of living foregone. The community needs to be made to face that cost, either each member individually or else via an objective investigation 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.

Some conservationists argue that putting a cost on saving 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 the environment can be extremely difficult (see Volume 3, Attachment 7A 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 those

values (often implicitly) all the time. The real difficulty is how to develop explicit valuation mechanisms which can be used to compare alternative land uses. 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 submitted (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 strong 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 economic considerations in a consistent framework. These ideas have evolved into concepts such as 'sustainable development' and 'multiple and sequential land use'. Such terms are often loosely used to describe the need for some sort of a balance between conservation and development. A detailed examination of the meaning and implications of 'sustainable development' is the subject of Section 8.

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;
- assess costs and benefits in a way open to scrutiny by those affected by decisions (transparency).

In broad terms, these mechanisms can be classified into those which rely on market-based incentives, and those which provide for a greater government role in decision making.

6.3 Market-based solutions

One approach to resolving public land-use conflicts is to rely on market forces to ensure that land is devoted to its most valuable use. The crucial advantage of a market based on private property rights to land is that it would help to ensure that individuals take the costs of their actions to others into account in their decision-making. Rather than relying on political lobbying to influence decisions, individuals would be forced to reveal their true valuations through the market. Indeed, a recent Commonwealth 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".

A market-based approach is based on the existence (or creation) of well-defined property rights to enable owners of assets to charge for their use (or to sell - or possibly lease them - to someone who values them more). Private ownership provides strong incentives to manage resource to maximise its value (see Attachment 2A). 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 proposition to mine Coronation Hill and share in profits from the operation. This may in fact be the only true test of who places most value on the area. Of course, transferring areas of high value to conservation groups would raise equity questions analogous to freely transferring mineral rights to surface owners.

A practical example of how a market-like 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 6.2). In June 1990, Alcoa was named to the Global 500 awards developed by the United Nations Environment Program for its mine site reforestation in this region (see Volume 4, 'Mining and the environment').

Box 6.2: Resolving multiple land use conflicts by negotiation

In 1972, an area of Jarrah forest in WA 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 (sub. 16, pp.5-6)

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. 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 (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 been devoted to that land use. As noted by the Australian Bureau of Agricultural and Resource Economics (ABARE 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 may be 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 the 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 Australian Conservation Foundation (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 trade 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 on a particular piece of land, mining will only proceed if it represent the most valuable land

use to society as a whole, rather than just the most valuable use to the miner. Making miners fully liable for environmental damages (eg via the posting of rehabilitation 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 of Volume 1).

DASETT considered (sub. 65, p.6) that, to date, price incentives for environmental goods had been restricted in Australia by: ingrained preference for "command and control" approaches by environmental agencies, opposition from environmental groups who fear polluters will be given too much leeway; opposition from polluters to high cost burdens (particularly where market measures are applied on top of direct regulation); difficulties in devising appropriate price incentive measures in many cases; and reluctance by governments to take a unilateral approach because of ramifications for international trade.

Also discussed in Section 7 is the notion that market-based approaches utilising the 'user pays' principle to successfully meet the goal of allocating resources to their best use would need to extend across all activities. Thus, not only should miners have to pay for the costs they impose on others for using a particular area of land for mining, so too should other individuals or governments have to pay for the costs they impose on others from devoting land to other purposes. The implication of this is, for example, that compensation should be paid by those benefiting or proposing national park or Heritage listings, where the effect of such declarations is to impose direct costs on others (eg holders of exploration or mining leases).

There is, then, considerable scope for increased use of market-based mechanisms for resolving many of the resource-use conflicts discussed above. However, in some cases market solutions may not prove feasible because of the nature of conservation goods (where it may be impossible to exclude or charge consumers of these services). In such cases, there may be a rationale for government intervention. However, as explained further in Section 7, government intervention even in these circumstances is only justified if it will bring net gains.

6.4 Government-imposed solutions

Where some government intervention is considered necessary, how should such decisions be made? On what principles should decisions be based?

Eggert (1989) argues as follows:

... from the firm's perspective, the net results of restrictive land-use policies are less exploration on public lands, higher cost mineral operations when discoveries are made and less production. Nevertheless, from society's perspective, these may be acceptable costs to incur, if there are benefits for restrictive policies that exceed these costs.

Ideally the policy-maker is charged with the task of considering policies from the perspective of society as a whole. With respect to public lands, policies should permit these lands to be used for that use or combination of uses that yields the highest value to society. If an existing land-use policy permits so much mineral exploration and development that it excludes other higher valued activities, then the policy should be changed, even if the mining industry suffers, because society as a whole gains. Comparing the potential values to society of alternative land uses- such as mining, forestry, grazing, recreation, and preservation - is extremely difficult. This is especially so when we consider that although some uses are mutually exclusive, others are not. The best use may change over time. Compounding these problems is the lack of a competitive market in which competing interests vie for use of the land. Instead, the government acts as a sort of central planning agency for the disposition of public lands.

Therefore some sort of value must be put on the environment and on alternative land uses, even if this is only a 'ball-park' figure. In the words of North Broken Hill Peko Ltd (North BH, sub. 33):

Customary cost/benefit analysis is often thwarted by such responses as "you can't put a dollar value on the environment". The impetus to conduct cost/benefit analysis can be reduced by exertion of the "dominant" nature of environmental law, which at times says that the environment comes first and other land uses are prohibited or run second.

In an ideal sense, the various laws relating to land use should be cross-referenced with each other to provide direct information on which law overrides which other for general cases of land use conflict. We can no longer afford environmental laws which, by dictate, always override mining law. It is noted that mining law has evolved over many years to accommodate other land uses, through mechanisms such as Warden's Courts and compensation agreements and conditions for entry and work on the property of others. Environment law lacks these accommodations. It should not.

CSIRO (sub. 61, p.21) also argue that:

Costs and benefits need to be carefully weighed in any decisions between land use options ... Without an indication and assessment of potential economic benefit forgone by not exploiting mineralisation in a region, rational decisions cannot be made.

The ACF commented (sub. 68, p.17):

Past experience in Australia has seen the issue of mining in conserved biological heritage as a circumstance where we earn export earnings or where we earn nothing but warm satisfaction (the industry would suggest cold comfort). However this inquiry and others must examine projects (also future and present conserved biological heritage) on the basis of comparing alternative income streams. Any failure to do so is likely to cause 'inefficient source use' and thus compromise the Commission's ability to carry out the terms of

reference adequately. It is unacceptable that simply because economics finds it difficult to price non-market goods those goods should be sold in the only clearly defined market that can be located - the mining industry.

Denison Australia argued (sub. 22, p.7) that:

Australian policy must move to a situation where all proposals to dedicate land to single or limited uses, to the exclusion of resource assessment, have full or 'best effort' accounting of the benefits and costs. The various Impact Statements required for development must be matched by similar statements for the proponents of non-development or dedication to single or limited usage. This is especially important for national parks. If these areas are of such value, that value will be easy to demonstrate. It is also necessary to consider a reassessment from time to time as situations change. It must be borne in mind at all times that today's resource may not be tomorrow's resource, and what we now regard as unrelated to our wellbeing may be vital and in short supply in the future.

CRA (sub. 73, p.107) considered that:

... while mining is essential to the Australian economy, there will be times when resource projects will not go ahead because environmental or ecological values are threatened. However, such decisions should be made on the basis of careful scientific and economic assessments involving Environmental Impact Statement or RAC procedures.

6.5 Putting principles into practice

While substantial agreement can be reached on what is required in principle, the true test comes in putting concepts such as 'sustainable development' and 'multiple land use' into practice. Unfortunately, these terms have come to mean all things to all people (refer Section 8). The Australian Petroleum Exploration Association Limited (APEA) (sub. 4, Attachment 1) commented that:

Simply stating that "one has a policy" or "supports" the concept of multiple land-use lacks substance and meaning unless one experiences the difficult process of implementation, realizes the compromises and the necessary shortfall of the actuality and then learns and conveys the information gained from the whole process.

In a similar vein, the ACF (sub. 68, p.3) lamented that:

Unfortunately the theoretical elegance is often not matched by practicality and efforts will need to be made to provide operational criteria ...

This highlights the need to de-politicise these concepts and to translate them into practical workable policies. The following discussion identifies two general requirements that would seem to be necessary to aid in rational government land-use decision making: the need for information and the need for certainty. Some specific initiatives which have and could be taken by governments in Australia to help resolve public land use conflicts are then examined.

The need for information

A primary requirement for sensible decisions on alternative land uses is to gather as much relevant information as possible on their relative costs and benefits (bearing in mind that generating relevant information also has its cost).

The Queensland Chamber of Mines considered that (sub. 74, p.16):

A major difficulty for government in assessing alternative land use options is to assess objectively what is in the public interest at a given time. If government is to be fully informed to enable it to assess objectively all the available alternatives, it must build and continually revise its resources inventory. The term "resources" is used here in its broadest sense and could refer to aesthetic, agricultural, forestry, mineral, geological or biological resources.

The Nature Conservation Society of South Australia (NCSSA) (sub. 30, p.1) commented that it had:

... observed a need for better information gathering and planning for environmental impact and rehabilitation and more regard to existing and potential long-term sustainable uses of the environment, particularly conservation. Costs associated with these activities should be fully accounted for at the start of a project and are a necessity for the long-term benefit of society.

The Environment Centre NT (sub. 126) also stressed the need for accurate information:

The integration of conservation and development is an issue for the whole community to address, however, there has to be information available which will enable the community to make sound decisions. The lobbying efforts of the mining industry do not improve the flow of accurate information to the public ... Accurate information is also difficult to obtain from the government. In the Northern Territory the community has little or no faith in the information provided by the Government department responsible for mining activities, the Department of Mines and Energy, and very little trust in a Government that puts mining first at all costs.

In choosing between mining and other public land uses the need for better information on environmental costs and benefits is, of course, matched by a need for as much information as possible on mineral resource values. The Normandy Poseidon Group (sub. 11, p.9) argued that:

Only when the potential value of a mineral resource and the specific details of developing that resource are known can a rational decisions be made as to whether it should be developed or not. The opposition of conservation groups to exploration does not appear to be due to the damage exploration may cause, which is generally none. It appears to be due to an absolute determination to preserve the environment as it is at that point in time, without risking the possibility that the community, on the basis of exploration results, may prefer development compatible with as much protection of the environment as possible.

As noted by the Geological Society of Australia (GSA, 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.

Moreover, GSA believes that access should be ongoing:

Scientific advances in many fields require the use of minerals which may previously been considered of little, or no, benefit to society. Earlier investigations may thus have ignored the potential of geological environments to host these minerals now considered to be of benefit. Thus, it is not possible accurately to state that because a particular area of land has been geologically investigated on one occasion, all mineral potential has been ascertained.

As noted by WMC (sub. 79, pp.18-9):

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.

Examples of this phenomenon include the discovery of the world-scale 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.

The Nature Conservation Council of NSW (sub. 50, p.6) considered that:

The argument used by the mining industry that decisions 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 heritage and should be preserved at all costs.

The NT Environment Centre (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 ore body 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.

These latter two arguments ignore the need for assessment of rational trade-offs or the ability of society to make such decisions. However, it should be emphasised that advocating that exploration be allowed everywhere except in truly unique, and by definition strictly limited, areas in no way supports claims that successful exploration should automatically be followed by commercial mining operations. To argue that mining should always follow exploration is to ignore the potential for more valuable alternative uses of a location. Society cannot guarantee that it will find it acceptable to proceed with mining in all cases when private interests find it profitable to undertake such an activity. The fact that mining companies may find it unacceptable to separate the exploration and extraction stages of mining and may decide not to undertake the first is neither an undesirable outcome nor a valid argument to ban exploration where extraction is highly unlikely to be allowed, such as in certain areas of (or perhaps at all in) national parks. This does not mean, however, that miners should not have a substantial degree of certainty as to the processes which will be followed in determining whether mining will be allowed should exploration yield an economic deposit.

The need for certainty

As illustrated earlier in this section (see also Section 12), existing mechanisms for resolving public land-use conflicts impose considerable costs through the uncertainty surrounding government decision-making processes. Many participants stressed the need for clearly defined rules and procedures to be spelt out.

North BH (sub. 33) 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.

Stockdale Prospecting Ltd stated that (sub. 43, p.2):

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 recognized 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.

A somewhat different view was put by Alcoa which stated (sub. 16, p.3):

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 latter 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, this clearly implies that there will be a decision made at a subsequent point, which in some cases will be not to allow mining. But this may depend upon the nature of the land (eg Aboriginal land, national parks). Miners should not have an absolute right but there should be clear rules as to how these decisions will be made (ie remove discretion). This would fulfil the need, already recognised by the Commonwealth Government (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." Where land has little alternative use, approval procedures should be relatively straightforward.

Commonwealth initiatives

In 1983 the Commonwealth Government, in consultation with a range of interested parties, concluded a National Conservation Strategy (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 supported the general sentiments behind the NCSA, there was a feeling that these principles had not been put effectively into practice. The Queensland Government, for example, commented that (sub. 55, p.27):

... the National Conservation Strategy for Australia particularly with respect to the application of multiple and sequential land use and sustainable development concepts, provides suitable guidelines for the integration of conservation and mineral development, but

often lacks the commitment of governments and interest groups. As well, the implementation of the strategy would be enhanced by further refinement of the sustainable development concept as it applies to modern mining practice. This would entail an integrated approach to incorporate rehabilitation, pollution control and product recycling.

The Queensland Chamber of Mines 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 in 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.

The 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. 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."

Whilst many participants generally supported establishment of the RAC, this support was generally qualified. For example, AMIC (sub. 29, pp.48-49) stated that "by the time the RAC legislation had passed through Parliament, it had been amended to place a stronger emphasis on conservation." The Council expressed concern that the whole Kakadu Conservation Zone (rather than the smaller area encompassing the Coronation Hill project and the El Sherana prospect) had not been referred to the RAC, and suggested that "the RAC process has been trivialised." In similar terms WMC whilst supporting the notion of the RAC in general terms, claimed (sub. 69, p.35) that:

... a number of factors appear set to nullify the RAC's potential to act, perhaps in the mould of the Industry Commission, as a neutral but powerful inquisitor, the reports of which are (or should be) unimpeachable. Already, the Government has indicated that the nature of

references given may be very restrictive (eg the Coronation Hill issue has been referred to the RAC, but in such terms as to ensure that only the narrowest possible area of the Kakadu region is examined), and compromised the purported neutrality of the RAC by allowing intervention by the Heritage Commission and preferential access for the conservation movement.

CRA commented (sub. 73, p.110) that it:

... supports Government measures currently being introduced that promise to promote a calmer analysis of the facts. It is proper that industry should know the environmental cost of economic growth, but it is equally essential that the public knows the economic costs of development foregone. For this reason CRA supports the establishment of the RAC and its original charter. However, its relevance will depend upon the readiness of Government to accept its recommendations particularly in light of recent Government decisions which have shown a marked bias in favour of environmental rather than economic considerations.

Oakbridge Ltd (sub. 32, p.34) suggests that World heritage listings be referred to the RAC. In similar terms, the Victorian Chamber of Mines argued (sub. 21, p.4) 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.

It further suggested that the RAC could assist in this process.

Other Initiatives

DASETT (sub. 65, p.2) noted that the Commonwealth Government has established an Interdepartmental Committee to examine the issue of environmentally sustainable development and its application to various sectors of the Australian economy including mining. This Committee released for public comment a discussion paper in June 1990 which, once finalised, will form the frame of reference for individual working groups (involving industry, union and conservation groups) to formulate sustainable development strategies for each main industry sector (including mining) which use or have a significant impact on natural resources.

The Commonwealth has also taken steps to improve the database 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, p.65) 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. Under Section 5 (1) (a) of this Act, the Council is to carry out investigations and make recommendations to the Minister with respect to the use of Public Land in order to provide for the balanced use of land in Victoria. According to the Chamber, the Council has compiled through surveys and research a bank of data on each of 17 study areas in the State and also undertakes special investigations into matters of particular concern. 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 Australian Conservation Foundation. A similar mechanism is apparently being established in WA.

The Queensland Chamber of Mines (sub. 74, p.30) considered it essential that State Governments put in place some policy framework whereby Cabinets can consider the interests of both conservation and development. It stated that "Queensland, in keeping with almost every other State Government, has no policy or framework to handle the looming conflicts of the 90's." It considered that the setting up of separate, self-contained Departments of the Environment served only to exacerbate the problem, since it was inevitable that, with no brief other than to "protect the environment", they proceeded without any regard to economic growth. It therefore believed that State Departments responsible for single industries should also bear the responsibility for environmental management. Moreover, it considered the creation of structural links between environment and economic ministries as urgent, "if we are to give anything more than lip service to the Brundtland Commission Report, which officially Australia and most other western nations say they support."

The Queensland Chamber of Mines also contended that, although they supported a RAC-style organisation in the Federal arena, it was not the answer to every individual project, being best suited to look at major industries or economy-wide concerns. The Chamber said (sub. 74, p.37) it would favour :

... a Council of Resource and Environment Ministers, rather than the currently separate Councils, Of Resource Ministers, Primary Industry Ministers and Environmental Ministers. Unless and until they are brought together, the conflicts will remain. Our industry and Australia will be unable to met the challenges of sustainable development.

The Queensland Chamber of mines noted (sub. 74, p.29) that, as a first step to formulating a strategy to resolve land-use disputes, the Government has included a specific term of reference for the Commission of Inquiry into the Conservation, Management and Use of Fraser Island and the Great Sandy Region conducted by Mr Tony Fitzgerald QC as follows:

... the establishment of principles, systems and procedures for the orderly development and implementation of policies and the resolution of issues or disputes concerning areas of Queensland in relation to which particular regulation or control may be needed for environmental, cultural or other special reasons.

In Tasmania, The Tasmanian Legislative Council set up a Select Committee in October 1989 to enquire into the general question of public land use. The 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 the 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 the constituent bodies of the Department of Conservation and Land Management (CALM). 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 in the final decision recommendation, and full Parliamentary debate and approval of the Minister's recommendation.

This is not to say that full-scale RAC or similar CBAs should be done on every land-use issue. Rather, there is a need for appropriate frameworks to be built 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.

One example is the South Australian model of multiple land use achieved through creation of the 'regional reserve' concept (see Box 6.3). According to the South Australian Department of Environment and Planning (sub. 2, p.3) this land classification was:

... worked up with the mining and pastoral companies. The process was amicable with a high level of co-operation. The participation of the mining companies (SANTOS and Delhi) appeared to be primarily based on a sense of corporate citizenship responsibility as there were no compulsion ... by the Government.

Further discussion of the Regional Reserve concept and its application in South Australia is at Volume 4, 'Conflict over the use of public land'. A number of participants, including several State governments (eg NSW Government) commended the Regional reserve concept as a useful model for other States to follow.

Box 6.3: Resolving land-use conflicts: the Regional Reserve concept

The South Australian 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, the previously uncontrolled tourist activities are now managed under the powers of the National Parks and Wildlife Act and Regulations, and increasing numbers of tourists are visiting the area.

Source: South Australian Department of Environment and Planning (sub. 2) and South Australian Chamber of Mines (sub. 132)

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 accumulating information on the amount of land available for exploration and on the 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.

The Northern Territory Government (sub. 136) stated that it was in the process of developing a conservation strategy for the Northern 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 (GIS) 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.

Intergovernmental initiatives

Decisions on public land uses are affected by all levels of government (Attachment 7A outlines the legal framework within which environmental regulation in Australia is conducted). 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. Relevant legislation which can and has been used to this effect includes the *Commonwealth National Parks and Wildlife Conservation Act 1975* (see Attachment 6A), the *Australian Heritage Commission Act 1975* (see Attachment 6B), the *World Heritage Properties Conservation Act 1983* (see Attachment 6C), and the *Environment Protection (Impact of Assessment) Act 1974* (see Section 9). Another mechanism the Commonwealth can use to stop some developments 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.

DASETT (sub. 65, p.5) considered that, when examining measures for altering signals provided to the marketplace for the allocation of resources:

... the 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.

The Trades and Labour Council of WA considered (sub. 39, p.28) that "environmental processes should be agreed to between the State and Federal Governments so that there is only one set of processes which a project must go through." In this regard, DASETT (sub. 65, p.9) noted that agreements are in effect between the Commonwealth and all State and Territory governments except Queensland (where an agreement is in preparation), to "facilitate co-operative arrangements for joint EIA of relevant projects to avoid duplication and enhance the efficiency of the EIA process."

The Queensland Government (sub. 55, p.28) did not view the RAC as a suitable vehicle for the resolution of the Commonwealth/State conflicts over resource use.

Clearly, the areas of land use and environmental management are ones which have suffered and continue to suffer from conflicts between State and Commonwealth powers. Development of

effective policies on these issues in the interests of the nation require some form of co-operation and consultation between the various levels of government. The proposed Commonwealth/State forums for pursuing microeconomic reform - which is all about improving the efficiency with which the community's resources are used - is one avenue through which such progress could be made. This might include agreement on and the publication of guidelines on the way in which World Heritage listing procedures will operate in the future.

6.6 Conclusions

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. While governments have supported concepts such as 'sustainable development' and 'multiple land use', much remains to be done in translating these into practical policies.

Considerable scope exists for implementing market-based solutions (eg the lodgement of 'environmental' (or performance) bonds, and the payment of full compensation to landholders affected by the actions of others) which force individuals (and governments) to take into account the costs of their actions on others. Consistent application of a user-pays approach would also entail that users of land for purposes other than mining should also pay for that use. For example, compensation should be paid by those benefiting from or proposing national park or Heritage listings, where the effect of such declarations is to impose direct costs on others (eg holders of pre-existing exploration or mining leases).

Where market approaches are not feasible, there may be a need for government intervention in land-use decisions. Such intervention should aim at rational, informed decisions made under 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 Australian 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.

An extension of these principles is that conservation proposals should be treated in the same manner as development proposals. Thus, while it is appropriate and proper that the likely environmental impacts of mining proposals be investigated, it is equally appropriate and proper that conservation proposals - such as proposals to declare national parks, World Heritage areas, or National Estate areas - be subject to economic as well as environmental or heritage assessment.

An important requirement for rational decision-making is the availability of accurate information on the likely costs and benefits of alternative land-uses. Governments can play an important role in the gathering of information with which society can make informed decisions and which no individual would have the economic incentive to collect. The development of environmental and ecological databases by both Commonwealth and State Governments is supported. Equally, however, there is a need for access to information on mineral resources. The Commission therefore recommends that access to land for 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. It is also important to bear in mind, however, that information-gathering is far from a costless exercise, so that, for example, gathering information on the possible effects of mining down to the last detail may not be a sensible use of society's scarce resources.

Because influence over land-use decisions spreads across jurisdictional boundaries, reform in this area 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 overriding Commonwealth power over the States on environmental and land management issues (eg World Heritage listings) - be addressed in suitable forums such as those proposed for the Commonwealth/State 'review of federalism'.

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, however, possibilities for employing market incentives should be pursued wherever feasible, in preference to an over-reliance on governments to resolve all conflicts which arise.

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6A EXPLORATION AND MINING IN NATIONAL PARKS

The 'conservation versus development' debate is perhaps at its most divisive when the issue of exploration and mining in national parks is raised. At one extreme, some environmentalists argue that virtually all economic activity should be banned in national parks and similar areas. Others concede that the debate should be about the net present values 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 when declaring national parks and by distinguishing between core ecological areas and buffer zones, and between different types of activity (eg exploration versus mining).

One consequence of a growing general community sensitivity to environmental issues and the value of conservation and preservation has been a substantial increase in areas of land set aside as national parks or reserves primarily for these purposes. At the Commonwealth level, the *National Parks and Wildlife Conservation Act 1975* (the NWPC Act) applies in areas of its jurisdiction. There is separate nature conservation legislation at the State/Territory level.

Access to national parks and similar reserves are important issues in the whole access to land question. The main points of contention revolve around the procedures for declaring national parks, and the nature of restrictions applying to activity within declared national parks. The following discussion examines these issues and some possible compromises.

6A.1 Procedures for declaring national parks

A major conclusion from Section 6 was that rational land-use decisions require the relative costs and benefits of alternatives to be weighed. A number of participants to this inquiry argued that the procedures for declaring national parks did not allow for a proper assessment of mineral resources or biological or other natural resources to be made. A common view was that of AMEC (sub. 15, Appendix 4, p.2) 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.

and that:

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.

and also:

Because of the increasing tendency by governments to grant blanket approval to large areas, it can be argued that many national parks now contain areas which are not unique - or even of high conservation value. This view is substantiated in the 1981 Report of the Select Committee of the Legislative Council on National Parks, both as a general statement and in referring to the Shannon D'Entrecasteaux National Park in particular.

Other participants, however, disagreed strongly with these sentiments and suggested that there was an urgent need for more national parks to be declared. The Total Environment Centre (sub. 10, p.4) argued that:

Only 1.1 per cent of Australia is currently protected as national parks free from mining. Only a fraction of this area is given legislative protection. Less than 0.07 per cent of Australia's territorial waters are marine reserves free from mining. These fractions are too small to influence the profitability of the minerals industry in Australia. The amount of protected parks should be quadrupled in the next ten years to protect wilderness and other areas of outstanding natural value.

In response to these types of arguments, the Queensland Chamber of Mines (sub. 74, p.32) contended:

A major threat for the future is the creation of national parks specifically to stop other activities, rather than for their own intrinsic merit. We reject as totally lacking in logic the claim that States should have an arbitrary percentage of their total area classified as national park. What does this have to do with the criteria for park creation?

Some participants argued that the procedures for declaring national parks were inherently unbalanced. For example, the Tasmanian Chamber of Mines stated that (sub. 81, p.10):

The State Government has the ability to dedicate an area as a national park, yet its revocation requires the approval of both Houses of parliament. Similarly, in regard to certain Conservation Areas, the responsible Minister can dedicate areas with apparent ease, but revocation requires the approval of parliament.

The Australian national Parks and Wildlife Service (ANPWS) rejected the view that procedures for declaring national parks did not take into account all costs and benefits and stated (sub. 83, p.9) that:

In relation to any proposal to establish a park or reserve under the NWPC Act, the mining industry, like other interest groups, can make its views known through the public consultation process that is required before a park or reserve is declared. The process allows for the alteration of boundaries and even the abandonment of the proposed declaration, if counter-arguments are sufficiently strong.

The Director, ANPWS is required to give public notice of any proposal to declare a park or reserve and to allow 60 days for representations (to which he must give due consideration). The Director then forwards a report on the proposal together with representations and his comments on them, to Executive Council. The ANPWS considered that :

At every stage of this process the importance to the community of the nature conservation values of the area can be assessed against other values. A final decision to allow declaration to proceed represents a decision to give priority to the former.

The Commission supports, in principle, the notion that procedures for declaring national parks should be assessed from an overall assessment of the benefits and costs. It questions, however, whether the ANPWS is the appropriate body to make such an assessment which, to truly represent "decisions to give priority to the nature conservation values", need to adopt a comprehensive cost-benefit framework.

The Total Environment Centre (sub. 10, p.5) stated:

Where mining is a suggested alternative use for a proposed National Estate area, national park or proposed marine reserve, the mining industry should undertake predictive studies before the development application stage. These studies should be undertaken by independent consultants and demonstrate the long-term effects of mining the area (eg land subsidence, changes to hydrology and wildlife habitat). Once these reports are received, the Government and the public can objectively review and assess the merits of the proposal).

The Centre also argued (sub. 10, p.4) that:

Exploration should not lock up or degrade land with significant natural resources for lengthy periods (eg the mining industry should not hold mining exploration licences or leases over national park proposals to frustrate dedication of parks).

It considered the Great Sandy Region of Queensland (including Fraser Island) and the Nattai National park proposal in the Blue Mountains were examples of where mining proposals have delayed national park proposals unnecessarily.

The Commission finds it difficult to reconcile these views. It would argue that, if a development project needs to be carefully assessed and subject to public scrutiny, so must proposals to declare national parks. If one accepts that mining projects may be delayed because of this requirement, it is also the case that proposals for national parks may be delayed while such a cost-benefit assessment is carried out. Indeed, under the NPWC Act, Conservation zones may be established to protect and conserve wildlife in, and the natural features of, an area until a decision is made whether or not to declare the area to be a park or reserve. The Kakadu Conservation Zone is the only such zone declared to date.

6A.2 Restrictions on exploration and mining in national parks

What restrictions apply at present?

Some indication of the nature of current restrictions applying to national parks and similar land in Australia can be gained from examining Table 6A.1. With some exceptions, exploration and mining is prohibited in national parks, or only allowed subject to approval by both Houses of Parliament of the relevant legislature. Even where exploration or mining is possible in theory, political realities suggest that in practice this is likely to be a rare event.

As an example of this, the ANPWS noted that, while Section 10 of the 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 reserved 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 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.

Exploration and mining is also restricted (or sometimes prohibited) in various other categories of reserves (see Table 6A.1). This varies widely across categories of reserve 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. Some illustrations are provided in Volume 4.

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 free from these activities. In the Commission's view, this debate is unhelpful. 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 questions such as: what restrictions should apply to national parks?

What restrictions should apply to national parks?

This question brings forth widely diverging answers which in itself demonstrates the difficulty in implementing 'multiple land use' or sustainable development' policies in practice.

Table 6A.1: Availability of national parks and other reserves for exploration and mining

<i>Jurisdiction^a</i>	<i>National Parks</i>	<i>Number</i>	<i>Approx Area. (hectares)</i>	<i>Other Categories of Terrestrial reserves</i>	<i>Number</i>	<i>Approx Area. (hectares)</i>
Commonwealth	Mining and exploration prohibited in Kakadu National Park. Theoretically allowed in other National Parks subject to conditions but no existing management plans allow for exploration or mining.	4 ^c	1 890 568	Reserves: as for National Parks. In a Conservation Zone (of which currently there is only one, the Kakadu Conservation Zone) exploration but not mining) is permitted.		
NSW	National Parks not currently legally protected from exploration or mining but NSW Government is introducing legislation to implement its policy which precludes mining in national parks.	68	3 103 761	New legislation wil also preclude mining in Nature Reserves, Historic sites and Aboriginal areas. Mining is to be permitted in State Recreation areas subject to certain conditions.	370	708 404
Victoria	No new exploration or mining permitted. However, relevant Ministers may consent to exploration and mining where there are pre-existing contracts.	33	1 202 116	For State parks and Wilderness Parks: as for National Parks. In other categories of reserves exploration and mining requires Ministerial and/ or Parliamentary consent or is prohibited.	329	627 867

Table 6A.1 (cont): Availability of national parks and other reserves for exploration and mining

<i>Jurisdiction^a</i>	<i>National Parks</i>	<i>Number</i>	<i>Approx Area. (hectares)</i>	<i>Other Categories of Terrestrial reserves^b</i>	<i>Number</i>	<i>Approx Area. (hectares)</i>
Queensland	Exploration and mining not permitted in National Parks or Environmental Parks.	317	3 522 129	Mineral exploration and mining Permitted, subject to agreed Conditions, in the 23 departmental and official purposes reserves, but not in the Great Barrier Reef, Marine Park or State Marine Parks within the Park.	257	141 640
Western Australia	Under a new policy approved in February 1988 all National Parks closed to exploration and mining unless a reserve (or part of a reserve) is opened for exploration following EPA assessment and approval by both houses of Parliament. This process must be represented to permit mining.	60	4 757 275	For A class Nature Reserves: as for National Parks	1 187	10 494 938
South Australia	Situation varies, either subject only to pre-existing mining rights or to these and the acquisition of future rights.	12	2 648 453		267	8 468 714

Table 6A.1 (cont): Availability of national parks and other reserves for exploration and mining

<i>Jurisdiction^a</i>	<i>National Parks</i>	<i>Number</i>	<i>Approx Area. (hectares)</i>	<i>Other Categories of Terrestrial reserves^b</i>	<i>Number</i>	<i>Approx Area. (hectares)</i>
Tasmania	Mining and exploration prohibited unless pre-existing mining right and management plan has approved such a provision. The only pre-existing right was revoked in 1989 and no management plan allowing exploration or mining has ever been approved.	13	851 140	As for national parks for nature reserves, aboriginal sites and historic sites, and game reserves. Exploration and mining permitted in conservation areas.	214	115 857
Northern Territory	Exploration and mining in parks and reserves possibly subject to special conditions exploration including rehabilitation of disturbances and compliance with environmental assessment act 1982. Some smaller parks and reserves and parts of larger parks and reserves totally protected from exploration and mining.	6 ^c	542 213		82	1 486 686
A.C.T		1	94 000		5	18 242

Table 6A.1 (cont): Availability of national parks and other reserves for exploration and mining

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- a Jurisdiction under which National Park or other Reserve declared. Thus Kakadu and Uluru National Parks declared under Commonwealth National Parks and Wildlife Act appear under Commonwealth Government rather than the Northern Territory.
 - b Including (See Aboriginal areas, Aboriginal sites, Conservation areas, Conservation parks, Conservation reserves, Conservation/recreation reserves, Environmental parks, Fauna refuges, Fauna reserves, Hunting reserves, Muttonbird reserves, Native forest reserves, Nature parks, Nature reserves, Other conservation areas, Other parks, Other reserves, Recreation parks, Reference areas, Regional reserves, Reserves, Scientific purpose reserves, State Recreation areas, State reserves, Wildlife reserves). In addition (but not included in the table above) there are some 228 Marine and Estuaries Protected Areas covering approximately 38, 397, 268 hectares.
 - c Includes Areas wholly or partially Aboriginal Land Managed as national parks.

Source: Australia National Parks and Wildlife Service (ANPWS) 1988,; and various submissions.

The Nature Conservation Council of NSW (sub. 50, p.5) considered 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 mineral processing. It claimed that the values of these areas were "self-evident" and that such objectives were "clearly incompatible with exploration, mining, and mineral processing."

In similar terms, the Environment Centre of the NT (sub. 56, p.4) saw mining and national parks as incompatible land uses. It noted that the Australian Council of Nature Conservation Ministers (CONCOM) has adopted the internationally accepted IUCN definition:

A national park is a relatively large area set aside for its features of predominantly unspoiled natural landscape, flora and fauna, permanently dedicated for public enjoyment, education and inspiration, and protected from all interferences other than essential management practices, so that its natural attributes are preserved.

The Total Environment Centre considered (sub. 10, p.3) that;

... all mining and exploration must be excluded from national parks, nature reserves, marine parks and the National Estate to preserve natural heritage, so that society does not waste its human and economic resources in needless political conflict.

The Environment Centre of the NT also stated (sub. 56, p.8) that:

And as for minerals being locked away forever, this may not be not necessarily be so. Future generations may decide that a resource within a national park is essential enough to justify its mining. The option is there. The option is also there for those generations to research the vast unknown but potentially beneficial resources held by the diverse range of species protected within national parks and conservation reserves. Or they might just decide to enjoy it!

The Australian Conservation Foundation adopted a slightly different approach (sub. 68, p.16):

The Commission will need to consider the interaction between the [mining] industry and Australia's existing (and future) conserved biological heritage. The industry will suggest that billions of dollars of valuable exports have been 'locked up' (ie diverted to alternative economic uses) under some form of conservation order with consequent ill-effects on the economy. In economic terms the debate should be about the net present values generated by alternative land uses. All land uses have an environmental dimension irrespective of their location on the continuum between national parks and cities ... this inquiry and others must

examine projects (also future and present conserved biological heritage) on the basis of comparing alternative income streams. Conserved biological heritage has an economic role to play in the Australian economy. National parks, for example, generate income in their own right. There is little credible suggestion these days of mining at Uluru or the Great Barrier Reef. Politically, such actions would be unthinkable - but also on an economic basis the non-mineral values of these two places may far exceed their mineral value. ... In providing a valid economic cost-benefit analysis the market for conserved biological heritage will have to be examined. This market 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 ... If national parks for example were a business, and in one sense this is what an economic approach implies, then the management needs to examine likely trends in the industry and how to respond most effectively.

This latter view correctly identifies the need for some form of (implicit or explicit) cost-benefit framework to be adopted. Such an approach is at least partially evident in recent changes to national parks legislation in Western Australia. The WA Government stated (sub. 48, p.3) that it had:

... a policy for protection of reserves and national parks but does not exclude the possibility of exploration and mining where such activity can be demonstrated to the satisfaction of the Parliament to have a higher value than the conservation value forgone.

Under this policy, announced in February 1988, all national parks and Class A reserves are closed to both exploration and mining unless a specific reserve or part of a reserve is opened for exploration following assessment by the EPA and specific approval by both Houses of parliament. However, areas of "the highest biological or landscape value" are to remain closed. The process of EPA assessment must be repeated before a mining lease can be granted.

The Trades and Labor Council of WA (sub. 39, p.27) submitted that:

... the new arrangements are considered an effective compromise between 'no access' and 'easy access'. Approval of both Houses of parliament will be necessary to approve the granting of a mining lease.

By allowing mining in national parks and A class reserves, the mining industry can search a much larger land area for the best reserves. Once the most viable deposits have been located, it becomes a matter of determining the social desirability of development and attempting to get a bill through parliament. This process would not normally be initiated unless returns were expected to be significant and environment disruption were expected to be low.

Although the Western Australian changes are not necessarily ideal, they at least a move in the right direction towards rational land-use decision making, by permitting at least some consideration of alternative land use values.

The logical extension of accepting the need to evaluate the costs and benefits of declaring national parks is that both variations in conservation values (including within national parks) and variations in the effects (ie costs imposed) by differing forms of activity on national park values should be recognised.

The need to recognise variations in conservation values

A common view of participants was that a 'blanket' approach, whereby restrictions on activity within national parks takes no account of varying relative values of alternative land uses does not make such sense. For example, the NSWCA (sub. 45, p.22) stated:

The concept and purpose of national parks has changed dramatically over the past 20 years. Originally, national parks were created for the purpose of public recreation, with environmental preservation as a secondary value. More recently, however, national parks have come to be regarded as areas within which the existing environment is strictly preserved, in some cases to the exclusion of virtually all human activity. It is recognised that the very features which make land worthy of dedication as a national park can often warrant such protection. However, such natural features rarely occupy a significant proportion of the land within any national park, with the remainder essentially serving as a buffer. In the Association's view, the restrictions applying to this buffer land could be relaxed without detracting from the overall purpose or value of the parks.

Alcoa (sub. 16, p.3) also expressed concern at the 'blanket' approach to mining in conservation areas. It stated:

... there appears to be a reluctance on the part of management authorities and conservationists to accept that conservation values can vary within wide limits, and that mining proposals can have widely varying impacts depending, on the scale of the operations involved and the level of rehabilitation expertise available. Large conservation areas should be zoned to allow for carefully managed commercial activities, including mining activities, if appropriate, in areas of lower conservation value.

Several participants expanded upon how such zoning arrangements might work. AMEC, for example, suggested that reserved areas (eg national parks, nature reserves, wilderness areas, etc) should be zoned into 'core' segments (in which mining would be banned completely); and 'buffer' zones (in which mineral exploration and mining would be allowed under an agreed set of guidelines and conditions). In addition, boundaries of national parks, and particularly the 'core' areas within them, should be drawn precisely, so that only the land necessary to achieve preservation of unique features, landscapes, flora and fauna, is enclosed within the 'core segment' of the Park.

As noted in Section 6, the SA Government has recently introduced a new land category - the regional reserve. These may be created 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 need to recognise differing effects of activities

A rational decision-making process would also require that, in determining whether, and which, activities should be restricted in national parks, the costs and benefits of different activities be taken into account. An important question which arises in this context is whether exploration should be treated any differently to mining in national parks. Again, participants held widely differing views.

The Nature Conservation Council of NSW (sub. 50, p.6) considered that :

The argument used by the mining industry that decisions 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 heritage and ... 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.

In direct contrast, CRA (sub. 73, p.106) stated 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.

BMR, while stating that it often enjoys a co-operative relationship with park management, cited one case (sub. 26, p.3) relating to an airborne geophysical survey it conducted over the Kakadu Conservation Zone (CZ) where:

The national park regulations in this instance required that each time the plane crossed from the CZ to the adjoining national park the geophysical recording instrumentation had to be switched off to avoid recording geoscientific information over the area gazetted as national park; on the other hand there are no restrictions on gathering geoscientific data over this national park by the use of remote sensing. It should be stressed that the information being gathered was geoscientific data of considerable basic importance and could not itself be classified as exploration, although it could subsequently be used by the exploration industry as well as for basic research and resource assessment purposes.

The Queensland Chamber of Mines (sub. 74, pp.20-21) 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.

However, Stockdale conceded (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 Commission's view is that the differing costs and benefits of exploration and mining should be recognised in restrictions on access to 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.

6A.3 Conclusions

The debate surrounding mining and national parks has, in the past, tended to focus on arguments as to what percentage of Australia's land surface should be totally protected from exploration or mining. The real debate should be about the net present values 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. This would imply that the processes for declaring national parks are similar to those for determining whether resource development projects should go ahead - that is, both should take into account both development and environmental concerns. Objective assessment of relative values of alternative land uses to society would also seem to require distinguishing between core ecological areas and buffer zones, and between different types of activity (eg exploration versus mining).

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.)

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Commonwealth Of Australia 1990, *Ecologically Sustainable Development: A Commonwealth Discussion Paper*, AGPS, Canberra.

Mobbs C.J. 1988, *Nature Conservation Reserves in Australia (1988)*, Australian National Parks And Wildlife Service (ANPWS).

6B NATIONAL ESTATE LISTINGS

The Register of the National Estate is a list of places which have aesthetic, historic, scientific, or social significance for current and future generations of Australians. Although in theory the Register serves only as an alert to planners and the broader community, in practice it may restrict access to land, despite the fact that economic factors are not taken into account in assessing places for inclusion on the Register. In the interests of rational land-use decision making, there is a strong case for amending the processes under which National Estate listings are made.

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.

A place on the Register may be a site, area or region; a building or other structure (which may include contents); or a group of buildings or other structures.

According to the Australian Heritage Commission, 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 these places is afforded under Section 30 of the Act, which provides that no Commonwealth Minister or agencies 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 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 before making a nomination. According to the AHC (sub. 24):

Nominations for the Register 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. (original emphasis)

These assessments are undertaken by bodies of experts. Any person may object to, or comment on, a proposed listing. Such objections are reassessed by a body of experts utilising the same criteria (for more details see Volume 4, 'Conflict over the use of public land').

Following a review by DASETT, the Government announced in November 1988 a number of amendments to the Act. These included: the incorporation within the Act of criteria elaborating the general definition of national estate; continuance of assessing nominations in terms of their national estate significance only (and giving prime consideration to this criterion when assessing objections); increased survey work by the Commission itself (in addition to developing the Register from public nominations); improved advice to owners of places on the Interim List; automatic removal of a place subject to objections from the Interim List if the objection has not been dealt with within 12 months (unless the Minister has agreed to an extension); appointment of independent assessment panels to advise the Commission on objections be appointed by the Minister. A major increase in the level of resources available to the AHC was also announced, to enable it to eliminate the backlog of nominations and objections (which stood at some 3406 at the end of 1988-89).

6B.1 Effects of National Estate listings on mining

Many participants in this inquiry contended that National Estate listing, rather than being merely an 'alert', did have a very real effect on the mining industry. WMC (sub. 69, p.34) argued that:

... the *Australian Heritage Commission Act 1975* is based upon powers which inevitably extend to virtually all mining activities, due to their nexus with foreign trade or investment.

In their submission, the AHC provided some examples of places on the National Estate Register relevant to the mining and minerals processing industry. These included areas of natural values such as the South Eneabba Nature Reserve in Western Australia, Shoalwater Bay in Queensland, Kakadu National Park in the Northern Territory, and Adamsfield in South-West Tasmania. Without entering into a debate on the merits of the national estate values of these areas, a relevant question is the extent to which these listings overlap with national parks or other nature conservation legislation, and whether it is sensible to have two different government bodies both expending public resources in relation to large tracts of land of 'nature' value.

Other examples of listed places extended beyond such natural regions to include even the remains of old mines. For example, the AHC claimed that the Sons of Gwalia Gold Mine in Western Australia was an important place in terms of Australian goldmining history, and that historic evidence (eg old mine workings, the head frame and winder, buildings in the adjacent village, processing components and the landscape associated with earlier mining operations) has been severely affected by the re-opening of the mine using open-cut techniques. The AHC also suggested that the remains of the Palmer River region goldfields (significant for the opening up of the Far North of Queensland in the nineteenth century) have been threatened by the granting of a mining lease in the area.

Several participants considered the *modus operandi* of the AHC suffered from a number of deficiencies (see Volume 4, 'Conflict over the use of public land'). For example, AMIC (sub. 29, p.45) suggested that:

The Heritage Commission has in many ways become a tool of the conservation movement, with conservation organisations nominating vast areas for inclusion on the Register, having them accepted by the Commission without any form of public inquiry, and the onus then shifting to those with other interests in the area to prove why it should not be included in the Register. With the national estate being defined in such a wide and imprecise manner, this becomes a nearly impossible task.

Sections of the conservation movement have not been slow to use the opportunities presented by the Heritage Act. The public naturally equates national estate listing with preservation, and the Heritage Commission does little to correct this view. Hence National Estate listing turns into pressure to create national parks which then becomes, in an increasing number of instances, application for World Heritage listing. The Kakadu, Daintree and South-West Tasmania regions are prime examples of this procedure.

WMC (sub. 69, p.34) argued that:

Again, although the Commission's powers enable it to expropriate exploration and mining rights granted by a State without compensation, its guidelines do not require it to give adequate consideration to the economic consequences of its actions.

In its 1988-89 Annual Report, the AHC welcomed recent government decisions - including that the basis for assessment of nominations are to continue to be national estate values only, commenting:

The decisions were welcome too because they reflected the Government's quite firm determination to protect the environment. In a society almost overwhelmed by the marketplace philosophy of economic rationalism, these decisions stated firmly that there are still values that our society must continue to support and uphold no matter what the perceived economic cost.

The AHC also argued in the same Annual Report that the establishment of the Resource Assessment Commission (RAC) would assist it because:

... no longer should there be calls from development interests for the Australian Heritage Commission to take economic, employment or production values into account when deciding whether to list a place on the Register of the National Estate ... The assessment of those values will rest now, in many instances, quite appropriately with the Resource Assessment Commission before which development proponents will be required to set out and clarify all costs and benefits ... In the end, of course, it is the government of the day which must decide where the balance is to lie after it has assessed all values and benefits.

The Tasmanian Chamber of Mines, however, argued (sub. 81) that:

A purely paper analysis of the purpose and powers of the Commission might go some distance towards supporting this view. But, more rigorous assessment of the actual role the 'heritage' decisions play in the wider political/administrative process and the total land-use debate, will produce a quite different view ... Public ignorance or confusion, and a concerted campaign to exploit that confusion is the real world in which heritage decisions are received by the government and the community. It is therefore a demonstration of political naivety to suggest that calls for tighter listing criteria, or for a representative decision-making process for the AHC, represent a misunderstanding of the purposes of the Commission. On the contrary, the time has come to recognize that the bona fide heritage concerns that inspired the 1975 Act, have been subsumed under a quite different agenda.

The Australian Petroleum Exploration Association (APEA) submitted (sub. 4, Attachment 1, p.18) that:

The present objection procedures outlined in the Australian Heritage Commission Act are totally inadequate. The Commissioners who hear objections are the same people who decide that an area is worthy of listing. Written objections only are permitted, objections are considered in secret and no reasons are given for decisions announced.

A further complaint was that the Act does not require the identity of the nominator to be made public. The Tasmanian Chamber of Mines (sub. 81) argued:

It is hard to see how the purposes of the Act are furthered by acceptance of submissions from groups or individuals who do not have the confidence in their nomination to publicly stand behind it. The absence of source-selectivity, and the encouragement of anonymous nominations is particularly worrying when one considers that the Commission is willing to accept three out of every four nominations it receives. That presently amounts to almost 9000 heritage items (and a backlog of 3480 awaiting consideration) of so-called "national significance".

A number of participants considered that owners of property affected by National Estate listings should be entitled to compensation from the Commonwealth Government. The Queensland Chamber of Mines, for example, stated that a case existed for Federal Government compensation to be paid to affected parties where a National Estate listing was made after the grant of exploration or mining permits.

6B.2 Proposed reforms to listing procedures

The APEA suggested that the Act be amended so that: AHC functions are limited to compiling a register of the National Estate and to encouraging public interest and corporate sponsorship of it; only governments in which the subject land is vested be able to nominate sites or areas; no nominations are accepted unless they have been subject to an environmental and resource/economic impact assessment under State or Federal procedures; and that objections procedures be made independent and reasons for decisions are made public.

The Tasmanian Chamber of Mines, while commending some of the recent reforms (eg clarifying the definition of the National Estate, empowering the Minister to direct the Commission to review the continued entry of a place in the Register), the Chamber considered these changes did not address the fundamental problem as it saw it: that the operations of the AHC led to de facto land-use decision making. Noting that there are nearly 9000 listing on the Register, the Chamber suggested that "Such an expansive Register will inevitably import wide variance into the heritage quality of listings", and suggested that establishment of a hierarchy of heritage sites based on their heritage value.

The Association of Mining and Exploration Companies (AMEC) also submitted a proposed model for National Estate listings including greater State/AHC consultation, improved public nomination and notification procedures, and the imposition of a six month time limit from the date of receipt of a nomination to the date of its listing or rejection (see Volume 4, 'Conflict over the use of public land').

6B.3 Conclusions

The Commission recognises that the historical preservation of certain sites is of value to the community. It also recognized 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.7), mining is currently taking place in National Estate areas.

Despite this, the 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; thus implying that these areas should be preserved at any cost. The level of public misunderstanding in relation to this title demonstrates the importance of a name. The name 'National Estate' is a misrepresentation of areas classified under this listing and therefore frustrates rational assessment of the likely costs and benefits of alternative uses of land.

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 National Estate and the Australian Heritage Commission with title 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 the grounds that such areas can be adequately protected by other existing mechanisms (eg National park declarations).

REFERENCES

Australian Heritage Commission (AHC) 1989, *Annual Report 1988-89*, AGPS, Canberra.

6C WORLD HERITAGE LISTINGS

While protection of places of world significance may be laudable, the procedures applying to Australian nominations have led to considerable conflict. There seems to be a strong case for reviewing these procedures to ensure that the values of all alternative land uses are properly taken into account and adequate compensation paid to those suffering loss as a result of such listings. Such reform would clearly require co-operation between State/Territory and Commonwealth governments.

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, notably South-West Tasmania and the tropical rainforests in Northern Queensland, nominations have been made without the agreement of State Governments. This action was taken under the Commonwealth *World Heritage Properties Conservation Act 1983* which prohibits acts which might damage or destroy such property.

Nominations are vetted by a 21 member World Heritage Committee on which Australia serves. The final decision on whether or not to uphold a nomination rests with the Committee, although it may seek additional information from the nominating country and take advice from other bodies (eg the International Union for the Conservation of Nature and Natural Resources (IUCN)).

To qualify for listing, a property must meet at least one of several criteria indicative of outstanding universal value. These include:

- outstanding exemplification of major stages in the earth's evolutionary history;
- outstanding representation of significant, ongoing geological processes, biological evolution and humanity's interaction with its natural environment;
- exemplary natural phenomena, formations or features (eg a major ecosystem);
- the highest degree of natural beauty, or unparalleled combinations of natural and cultural elements: and
- natural habitats where threatened species of animals or plants of universal value (from the science or conservation viewpoint) still survive.

There are currently eight Australian places on the World Heritage List (see Volume 4, 'Public land use conflicts'). These are the Great Barrier Reef, the Lord Howe Island Group, the Willandra

Lakes Region of New South Wales, the Tasmanian Wilderness, Kakadu National Park (Stages 1 and 2), the Australian East Coast Temperate and Sub-tropical Rainforests Parks, Uluru National Park, and the Wet Tropics of North Queensland.

6C.1 Effects of World Heritage listing on mining

Several participants expressed concern with the effects of World Heritage listings on mining. For example, CRA (sub. 73, p.110) stated that:

The current Minister of the Environment claims that the inclusion of a region on the World Heritage list does not automatically rule out all forms of resource development in that region. Both the mining and forest industries believe that realistically it does given popular perceptions of the role of World Heritage areas. It particularly concerns industry that a final list of proposed World Heritage areas has never been drawn up.

The Queensland Chamber of Mines (sub. 74, p.33) noted that:

Australia is the only country in the world, among 104 signatories to the World Heritage Treaty, to impose World Heritage on its citizens by legislation. Elsewhere it is done by common accord and with general approval.

Nowhere else in the world does a country attempt to prevent other activities by imposing World Heritage areas on areas not previously protected by that country through the declaration of National Parks or protected area status ...

If an area has not previously merited classification and protection [ie has been listed on the National Estate or is a designated National Park] we fail to understand how a case can be made to the World Heritage Committee that this same area ranks as one of the planet's great treasures.

The Tasmanian Chamber of Mines observed in its submission (sub. 81):

While our Federated structure is admittedly a predisposing factor, it is nonetheless noteworthy that eighteen years after the Convention's inception, Australia remains the only nation to have taken the legislative route.

Australia distinguishes itself in another respect also. It does not have an indicative inventory of property that may be nominated for World Heritage listing. Australia again stands alone on this issue.

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 (see Box 6C.1).

Box 6C.1: World Heritage listings: the rainforests of Far-North Queensland

In 1987, the tropical rainforests of far North Queensland were nominated for World Heritage listing. At the time, there were 38 Authorities to Prospect (ATPs) valid in the area within the proposed boundaries. The Queensland Chamber of Mines said it would support the concept of World Heritage provided the rights and responsibilities of existing tenure holders were protected, and the area 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 claimed that, within 12 months all exploration activity had ceased, and subsequently about half of the holders of ATPs "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)

The merits of listing this area as a World Heritage site is not an issue the Commission is well qualified to debate. Box 6C.1 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 (sub. 89, p.77) cited Tasmania as another area where World Heritage nominations were proceeding without proper account being taken of the economic costs or benefits of segregation. It claimed that:

... in Tasmania, World Heritage nominations are proceeding in spite of the BMR report showing the high prospectivity of some areas. National Estate listings are proposed for large areas of rain forest which overlie zones of high to very high prospectivity for base metals. A Greater Western Tasmania National Park is being proposed by conservationists which will have the effect of sterilising large parts of the Mount Read mineralised belt.

Considerable concern was expressed that the *World Heritage Properties Conservation Act 1983* allowed the Commonwealth to intervene in State land-use issues simply by nominating the area for World Heritage listing. According to AMIC (sub. 29, p.47):

The Commonwealth ... gave an undertaking that "it will not take unilateral action to nominate areas for World Heritage listing without the agreement of the State or Territory concerned". The Government said, in its view, "such action would be more likely to lead to confrontation with States or Territories which may well do more harm than good in the long run". Six months later these noble sentiments were watered-down to a statement that the Commonwealth "will not normally nominate areas for World Heritage listing without the agreement of the State or territory concerned." A few months after that, the Commonwealth unilaterally nominated 6000 square kilometres of the Kakadu region to the World Heritage

List without even the pretence of consultation with the Northern Territory Government. This was followed by the nomination of the North Queensland rainforests, based on a report by a conservation group commissioned by the Australian Heritage Committee and against the wishes of the then Queensland Government.

The Tasmanian Chamber of Mines stated (sub. 81) that:

Management plans in the Australian context have been considered only after an area has been submitted to the World Heritage Committee and the nomination accepted. Any subsequent Management Plan is fundamentally impacted by that one fact, such that it is no longer possible to consider the relative merits of the competing land uses on a "level playing field". By the time these competing uses are considered, it has been decided that they can only be accommodated to the extent that heritage values are not affected. The process fails to recognise that preservation of heritage values is itself a competing land use and a true consideration of the broader public interest is thereby precluded.

6C.2 Proposed reforms to listing procedures

The Tasmanian Chamber of Mines (sub. 81, Appendix 1 p.7) suggested that existing procedures in Australia for nominating World Heritage sites could be improved by adopting some of the provisions applying to these nominations in the USA and Canada. These include a requirement that the nomination should already be a National park, State Reserve or some other type of conservation area; that property owners must concur in writing with the nomination; and that a management plan must be in place before the nomination proceeds.

AMIC and APEA have both supported a procedure whereby:

- sites of Heritage value are considered on a hierarchical basis from State through National to World level, the selection criteria becoming more stringent towards the higher level of the hierarchy. Sites nominated for World Heritage listing should be first nominated, assessed for and listed on State and National registers in that order;
- all parties with demonstrable interests in the area (including owners and occupiers) are advised of nominations and given an opportunity to contribute to the assessment of that nomination;
- existing rights of such interested parties are protected, including payment of compensation where listing eventuates;
- nominations to the World Heritage Committee must be accompanied by a proposed management plan developed through a process of public consultation.

The Queensland Government (sub. 55, p.28) drew the Commission's attention to suggested improved processes for World Heritage assessment arising from the May 1989 Report of the Australian Minerals and Energy Council Working Party on Commonwealth/State Co-operation on

Mineral Development. The essential features of this proposal include extensive Commonwealth/State consultation commencing at an early stage, an assessment of conservation and resource values and net community benefits, joint preparation (if nomination proceeds), of a management plan based on NCSA principles with public input. Oakbridge Ltd (sub. 32, p.34) suggested that World Heritage listing proposals could be referred to the Resource Assessment Commission.

Another important issue raised by participants to this inquiry was that of payment of compensation to those affected by World Heritage listings. A common view was that of the Queensland Chamber of Mines which argued (sub. 74, p.34) that:

Compensation should be payable where business and industry is operating under the legal *imprimatur* of a State Government or Territory and subsequently finds the blanket of World Heritage thrown over their operations.

It compared this position to that of a landholder which under the State Mining Act would become entitled to claims for compensation where a mining lease is granted, since this in effect represented a Government approval of a change in land use. It suggested that the Commonwealth Government should be subject to the same requirements in these analogous circumstances.

6C.3 Conclusions

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 as strong case for changing the procedures applying to Australian nominations for World Heritage listings. The basic aim would be to ensure that all 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 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 landholders. Such reform would clearly require co-operation between State/Territory and Commonwealth governments and may therefore be a possible item on the agenda for Commonwealth/State micro-economic reform.

PART II

MINING AND ENVIRONMENTAL CONCERNS

MINING AND ENVIRONMENTAL CONCERNS

Environmental concerns have led to quite irreconcilable stances on the part of various groups in relation to several crucial issues for mining and minerals processing (such as the acceptable location of mines and processing facilities or the most desirable rate of mineral extraction).

Even when those differences seem so be reconciled and widespread support for a concept such as 'sustainable development' emerges, fundamental conflicts surface as the debate progresses from the abstract to the concrete (such as whether or not mining should be permitted in national parks under any circumstances).

Significant disagreements also exist in relation to the practical implications of the fact that the physical stock of minerals is finite. In this part of the report, physical depletion of mineral is identified as a currently negligible problem.

In practice, the genuinely important environmental issue facing mining and minerals processing activities is their actual or potential effects on local, national and even global activities and the natural environment. The various services provided by this environment are scarce resources and using them for one purpose (eg mining) may diminish the environment's ability to satisfy other demands. Hence, there is sometimes a need to choose between useful but often mutually exclusive activities.

The key to a socially efficient use of the environment is to provide incentives for mining and mineral processing activities (and indeed all other users of the environment) to take into account the full opportunity cost of their activities (eg their use of water, land and the waste disposal capacity of the local environment).

In some cases, ensuring that proper account is taken of prospective costs and benefits of competing uses may simply be achieved by defining and assigning property rights over environmental services. In other cases, however, more direct government intervention may be required. Whenever possible, that intervention should desirably take place through the use of market-oriented mechanisms.

7 MINING, MINERALS PROCESSING AND THE ENVIRONMENT

A precondition for the efficient production and processing of minerals is that the social benefits associated with those activities be at least equal to the social costs, including the cost of 'services' provided by the natural environment (such as a source of raw materials and as a sink in terms of its waste disposal capacity). In the past, mining (along with most other economic) activities did not take full account of such environmental costs. Solving or preventing the resulting misallocation of environmental services requires providing effective incentives for mining-related firms (and other users) to take into account the total social value of those services. In some cases, this may be done by assigning property rights to environmental services and allowing direct arrangements between their owners and mining-related firms. In other instances, however, government intervention is necessary. Preferably, that intervention should take place through the use of market-oriented mechanisms (such as effluent charges), although in some cases 'command-and-control' systems (such as emission standards) may be required as well.

We are all becoming increasingly conscious not only of the close interconnections between economic activity and the environment, but also between economic growth and at least the potential for environmental damage. As a society, we may very well have to accept that green growth will indeed be somewhat slower than a dash of the dirtier variety. But it is also worth making the point at the outset of this discussion that most bad environmental policies are caused by bad economic policies. Also, although the focus of discussion here is necessarily the mining and minerals processing industries, it is also worth making the point at the start that other economic activities may cause (or at least have the potential to cause) as much, if not more, environmental damage as activities under reference in this inquiry. Indeed a strong case can be made that the most intractable sources of pollution will increasingly be small companies and individuals, not big firms like those that tend to dominate the mining and mineral processing sector in this country).

Mining and (relatively) more recently the processing of minerals - like all human activities - have disturbed the natural environment since such activities were first undertaken (arguably since the Stone Age).¹ Indeed, change has and continues to be a constant for both human societies and the earth. This means that arguing that "no biochemical changes due to human activities are acceptable" (as some people maintain) is not tenable. The mere existence of humans in any numbers leads to changes in the landscape and habitat. Thus, even very simple technology and agriculture have changed the face of the planet. There will always be differing perspectives about appropriate trade-offs: for example about economic benefits versus environmental costs, about

¹ The appearance of metals (eg copper, gold, iron) in the archeological record was so important and so apparent that it has served as one of the foundations of archeological classification (eg the Stone, Bronze and Iron Ages).

tolerable levels of pollution, and about land-use decisions (particularly where public land is involved). Because of differing vested interests and value systems, people will disagree, sometimes fundamentally, over public policy on these matters (and this applies to mining and early-stage processing of minerals as much as it does to, say, tourist developments).

The following excerpt, from what was probably the first mining textbook, *De Re Metallica* by Georgius Agricola, published in 1556, shows that the production of base metals has always caused concern among those who care about the environment:

The strongest argument of the detractors are that the fields are devastated by mining operations ... the woods and groves are cut down, for there is need of an endless amount of wood for timbers, machines and the smelting of metals. And when the woods and groves are felled, then are exterminated the beasts and birds, very many of which furnish a pleasant and agreeable food for man. Further, when the ores are washed, the water which has been used poisons the brooks and streams, and either destroys the fish or drives them away ... Thus, it is said, it is clear to all that there is greater detriment from mining than the value of the metals which the mining produces.

Nothing much has changed in the meantime except, of course, that mankind's ability to affect the natural environment has increased dramatically - with modern society's appetite for goods of mineral origin mushrooming to the point where the effects of mining and mineral processing activities on the environment have become a widespread, not to say major, concern.

The discussion in this section is premised on two important facts:

- The natural environment provides essential services to numerous socially beneficial activities (including mining and minerals processing); and
- The environment's capacity to provide such services is finite.

This section abstracts from the issue of mineral scarcity. For reasons discussed in Section 8 and Attachment A, the possible depletion of minerals is not regarded here as an environmental issue. Rather, the environmental problems discussed in this section focus on the actual extraction and processing of minerals and the potential for such activities to harm the environment, and more particularly what should be done about it. It should be also pointed out that, although different in nature, land access and environmental issues are often perceived as being closely associated - due to the attention focused on land-access conflicts, such as mining in (or versus) national parks. Thus, some of the issues raised here are considered in more detail in Part I of this Volume (Access to Land).

7.1 Services provided by the environment

Historically, most economic activity (including mining and minerals processing) took no account of the costs imposed on its surroundings. For example, factories polluted rivers as if the rinsing waters flowed past them for free. Many environmentalists would argue that this situation still prevails today. These 'environmental' bills have been and are left for others to pick up - neighbours, citizens of other countries, and future generations. A truly green economy would pay such bills as it went along, not slip them to posterity. To the extent that it had to forgo consumption today, in order to bequeath more of the world's resources and rubbish-absorbing capacity to its children, a green economy would not grow as fast as a dirty one might.

Like most economic activity, mining and mineral processing looks to the natural environment to serve as the source of raw materials (eg mineral deposits) and as a residuals sink (all forms of consumption and production necessarily generate waste products or residuals for which the natural environment is the ultimate dumping place or sink).

Society has painstakingly sought to define ownership and control over the flows between primary industries, manufacturing and services, and consumption since very early times. It has been evident for a long time that those flows are finite, their value recognised, and property rights have therefore been attached to them. It was only in more recent times that the true scarcity of natural materials has been acknowledged and property rights to such objects as minerals and forests assigned. The real value of the environment as a sink, amenities source, and life supports has only been recognised much more recently. Not surprisingly, initially most economists concerned themselves with the analysis of the relationships between production and consumption and with the flow of goods and services between them. Economists saw little need to examine the use of the seemingly unlimited capacity of the environment to serve as a sink, amenity source and life support. That is no longer the case. The looming scarcity, and value, of environmental services is now becoming increasingly apparent. This has created the need to implement mechanisms to ensure that society makes the best possible use of those services, so that their allocation is socially efficient.² As the Australian Mining Industry Council (AMIC) pointed out (sub. 29, p.5) this includes the explicit objective that "mining must not endanger the natural life support systems - the air, water, soils flora and fauna."

7.2 Environmental impacts of mining and minerals processing

As Flawn (1966) put it:

Man, like an earthworm, burrows into the earth and turns over its surface; like a bird, he brings material from elsewhere to build his nest; and like the pack rat he accumulates quantities of trash.

Needless to say, most of these activities have ecological side-effects. Mining and processing operations in remote areas, for example, may involve the construction of whole new towns and related infrastructure, such as roads and airstrips. In the case of opencut mining operations, disposal of potentially large quantities of overburden can be a major problem, with backfill the obvious (but sometimes prohibitively expensive) solution. If the topsoil is saved, then rehabilitation to agricultural or recreational use is often possible (so that mining becomes a temporary land use, rather than a permanent blot on the landscape). Where dredging is involved, disposal of spoil is the main problem, along with possible changes to the equilibrium of local water systems. Widespread extraction of sand and gravel can lead to serious erosion of rivers and beaches. The processes of concentration, beneficiation, and smelting/refining may all harm the environment and create biological change if unwanted by-products (particularly toxic ones) are

² The concept of efficiency relevant here defines an efficient allocation of resources as one where no one in society can be made better off without making someone else worse off. Such allocation is called Pareto optimal.

released into local ecosystems. Washing yields sediment and slime-charged liquid wastes, leaching produces spent acids, flotation is a source of tailings and contaminated liquids, and smelting gives rise to slags and gases high in elements such as sulphur. Tailings and other mine wastes have to be disposed of, the former usually having to be stabilised with vegetation to prevent wind and water scattering the often fine dust that is the final product of evaporation.

Each mine/processing plant, along with the energy use from which it is inseparable, produces local ecological change by placing a strain on the capacity of the biosphere to absorb the concentrations of elements which industrial processes create, and which the financial imperatives of the operation usually dictate shall be discarded.

In evidence to this inquiry, there was little agreement on the extent and severity of environmental problems caused by mining and mineral processing. In relation to exploration, for example, the Normandy Poseidon Group claimed (sub. 11, p.11) that:

It is fortunate that exploration can be carried out without damaging the environment and that mines can be operated and sites restored, so that there is no significant, long-term damage to the environment.

This claim is in stark contrast to that of the Australian Conservation Foundation (ACF) which argued (sub. 10, attach.) that:

Modern mineral exploration makes extensive use of mechanical equipment such as fixed-wing planes, helicopters, bulldozers, drilling rigs, and mobile caravan accommodation. Landing strips and pads, drilling sites, road access and use of bulldozers often cause extensive as well as intensive damage to natural systems, species, aboriginal sites, historic sites and landscapes ...

Notwithstanding that all mining and mineral processing activities affect the surrounding environment in some way, the magnitude and type of these impacts can vary greatly among stages. A brief description of the main impacts of mining activities on the environment by stage of production follows. Numerous other examples of possible damage caused by activities under reference are listed in Volume 4 'Mining and the environment' - which reproduces selected evidence provided by the ACF, the Nature Conservation Council of NSW, the Environment Centre (of the NT), and the Total Environment Centre.

Exploration

In general, the exploration stage is the least disturbing stage of the exploration-mining-processing sequence. Some forms of exploration have no environmental impacts (for example, remote sensing by satellite). Others, such as airborne surveys, involve only minor temporary effects, such as noise pollution - although even this can be disruptive. For example, the ACF claimed (sub. 10, attach., p.3) that:

Woolwonga Wildlife Sanctuary at Kakadu was overflowed at 200 feet for a fortnight in the bird breeding season with resultant disruption of breeding populations.

Still other exploration activities (eg drilling and exploratory stripping and trenching) may produce significant environmental disturbances whose effects can persist for extended periods. Roads and the passage of vehicles and equipment affect land surfaces and vegetation, and can attract heavier use by others (whether this is undesirable cannot be determined in general). Geological survey grids disrupt vegetation and appearance. Again the ACF indicated (sub. 10, attach., p.3) that:

The Simpson Desert is now gridded in both directions by seismic lines and access roads. In another desert situation catch pits for road construction held water through the dry season allowing rabbits to eat all vegetation from a region previously inaccessible to them. Moore's Valley in south-west Tasmania has been heavily scarred by mineral exploration. Construction of permanent bridges over rivers greatly increases unsupervised motorised access into previously remote country.

Many of the potentially adverse environmental impacts of exploration can be prevented such that the whole process does not seriously disturb the environment. However, the issue is not whether those impacts can be minimised - they can always be entirely avoided by banning exploration. Rather, the issue is determining what level of disturbance and damage to the environment is socially acceptable, given the potential gains associated with mineral exploration and the nature of the land proposed to be the subject of exploration activity.

Development and extraction

The development stage of mining involves the sinking of shafts, the excavation of pits, and the construction of buildings and transport facilities. Dust, noise, and other environmental and socioeconomic impacts are generated by the relatively large and sudden influx of people involved in a new mining operation. Surface disturbance and solid waste generation are usually unavoidable at this stage.

The environmental effects of the extraction stage differ as between surface and underground mines. The main effect of opencut mining is surface disturbance. Overburden and waste accumulation become an unsightly feature of the landscape. Wind and water erosion may spread those accumulations over large areas. Underground mines, on the other hand, usually create little surface disturbance during extraction but subsidence and landslides may be a problem. In this respect the Bolton Point/Marmong Point Progress Association pointed out (sub. 47, p.1-2) that:

The application of new, high extraction rate technology to underground mining impacts upon the ground surface causing land subsidence. Longwall mining is one such technology and is causing this problem in our area. This conflict in our area has become particularly acute because we believe that our area is the first large-scale urban area in Australia which is planned to be longwall undermined.

The subsidence caused by longwall mining and its associated ground strains damages homes and public and community buildings, roads, gutters, drains and sewerage reticulation. The subsidence can also cause cracking of the ground surface leading to soil erosion and changing of the water table levels, subsidence of the lake foreshore leading to changes in the contours of the lake foreshore, increasing the susceptibility of low lying areas to flooding and adversely affecting watercourses.

In addition, both surface and underground mining may become sources of acidic or alkaline waters - sometimes contaminated with particulates and heavy metals.

Beneficiation and processing

The beneficiation of minerals usually involves crushing and grinding operations. These activities may generate airborne particulates and noise. Major waste disposal problems are associated with tailings which may be distributed by wind and water erosion over wide areas. Leaching can produce significant water pollution. The Environment Centre (of the NT) claimed (sub. 10, p.14) that the Rum Jungle uranium mine is an example of this:

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.

Metal refining can produce atmospheric pollution, such as the release of sulphur dioxide associated with copper smelting. Still, the main concern appears to be the production of solid and semi-solid wastes and the hazard they represent for water contamination. Potentially dangerous substances are required in many refining processes. For example, cyanide and mercury are used in gold processing and could cause major damage if released into the environment. Again, according to the The Environment Centre of the NT (sub. 10, p.15-6):

Alumina refining uses caustic soda to produce alumina and red mud. Vast 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.

Control measures

Many environmental effects of mining and mineral processing activities can be mitigated, but only at a cost. Dust suppression techniques and collection systems can be used to reduce particulate emissions. These techniques include application of water and chemicals stabilisers to the surface of potential dust sources or the collection of dust generated by such activities as drilling and cutting.

Atmospheric pollution associated particularly with the processing stage of mining may be reduced by several means. These include mechanical collectors, electrostatic precipitators, fabric filters and scrubbers. Reducing atmospheric pollution often produces significant volumes of solid or semi-solid waste which represents a potential source of pollution on its own. Scrubbers, for example, may produce slurries that are corrosive and often require further treatment before their disposal into the environment can be considered safe.

Even visual pollution can be ameliorated, although there will probably always be disagreement on the aesthetic merits of measures such as those taken by Coal and Allied which pointed out (sub. 79, p.5) that:

Tree screens were planted early in the development phase of the project, to limit the mine's visibility from public viewing positions. These screens are now effective and enhance the landscape character of the site as well as providing good screening capability.

A tourist lookout has been provided at a vantage point overlooking the mine and coal handling area to cater for visitors interested in viewing an opencut mine.

Water pollution probably represents the major potential threat to the environment from mining. Measures to counter this threat fall into two general categories: in-process and end-of-process controls. The first category focuses on process changes available to existing operations to improve water quality or reduce the quantity of wastewater which has to be discharged. Impoundment and evaporation - practiced at many mining and beneficiation operations in arid regions to reduce the volume of discharges - are examples of in-process techniques. End-of-process techniques are utilised to improve quality characteristics that are not (or cannot be) prevented through in-process control. Examples of end-of-process techniques include sedimentation, filtration, and pH neutralisation.

Various participants submitted evidence that mining activities, if undertaken carelessly, can result in widespread permanent damage to the environment. Such a prospect causes understandable alarm in the case of those potentially affected. For example, the Aboriginal Co-ordinating Council (sub. 36) pointed out that:

Aboriginal communities are continually concerned about protection of river systems, forests and lands that are used for hunting and which provide many of the traditional foods that remote communities depend on. Mines located at the head or on the upper reaches of river systems affect communities that may be located further down stream from mining sites, or near the mouths of rivers, for example Kowanyama, located at the mouth of the Mitchell River.

As a result of growing concern about the potential for mining and similar development projects to damage the environment, legal restrictions specifying what is and what is not acceptable behaviour have multiplied. Some of the relevant legislation is discussed in Attachment 7A. Arguably, such restrictions have, in part, been responsible for a significant decrease in adverse environmental impacts of mining activities achieved over recent years. However, it is also arguably the case that similar improvements could have been achieved more efficiently in less directive and less costly ways.

Consideration of the potential and actual environmental impacts of mining and mineral processing activities, compared with similar impacts associated with other economic activities, raises the question of whether the former should be singled out for special treatment. The environment is continually being disturbed by what are regarded as beneficial human activities, including those undertaken to provide shelter and food. Minerals are also indispensable and no participant in this inquiry questioned the general proposition that mining activities are socially useful (even indispensable). Rather, several participants questioned the location of certain mining or processing activities and/or the magnitude of adverse environmental impacts in relation to demonstrable benefits.

7.3 Economic approach to the environment

By definition, scarce resources are incapable of satisfying all their potential uses and hence must be rationed somehow. Economics is the study of how that rationing or allocation is made among competing ends. From that study, economists have advocated various mechanisms (eg competitive markets for goods and services based on private property rights) to allocate scarce resources in the most socially efficient manner. Such mechanisms are based on the fundamental observation that all potentially useful human activities involve costs - as well as conferring benefits - and that any rational analysis should take both into account.

For example, to answer the question of whether a mining project should be allowed to proceed in a national park requires considering the likely benefits forgone if mining is not allowed (for example forgone royalties which could have been used to fund socially beneficial infrastructure - such as a road or a hospital), as well as the potential costs involved if the mining operation results in damage to the surrounding environment (and therefore undermines the amenity value or ecological integrity of the park). The decision is not necessarily a simple one to make, but society has always had to make choices of this type. Implicit in this type of decision is the need to use measures of relative worth. Thus such a decision may, for example, imply that not allowing a mine in a national park is worth not upgrading a road or building a new hospital.

Fundamental to making an informed decision of this type is the need to identify and bring to common account the likely costs and benefits associated with a particular project. Such costs and benefits are examined next, as well as how they can jointly determine an efficient level of use of environmental services.

The demand for and supply of services provided by the environment

The gross benefit derived from undertaking mining activities can be measured in dollars as the gross revenue from mineral production. The net benefit to society is the difference between that revenue and total costs - which should include the cost of necessary inputs such as labour, materials, plant and equipment, as well as services provided by the environment. Summing the services required by mining and provided by the environment - in the form of mineral deposits, land, and as a residuals sink - results in the total amount of environmental services required to undertake a particular mining activity. A demand curve for environmental services can then be derived, at least conceptually, for environmental services in a similar way as for most other inputs.

The use of the term 'environmental services' is used here to emphasised the fact that the environment is an essential production factor in mining activities which is not fundamentally different from services provided by other inputs. Mining activities cannot be carried out without the use of the environment in the same way that those activities are not possible without the use of labour and capital.

There are costs associated with the use of the environment to provide the services required to undertake mining and related activities. These costs arise from the fact that a finite environment implies that using certain of the services it can provide for a particular mining activity may require

forgoing, at least in part, using it for other purposes (for example, agriculture or recreation). Such a forgone use represents the opportunity cost of environmental services consumed by mining activities. Opportunity costs can be quantified in dollars, again at least in principle, so that the cost of forgone activities is expressed in the same units as the benefits.

In the past, mining activities were frequently perceived as the only viable user of environmental services 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. This situation has progressively changed as a result of:

- increasing population straining the capacity of the environment to serve as a 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.

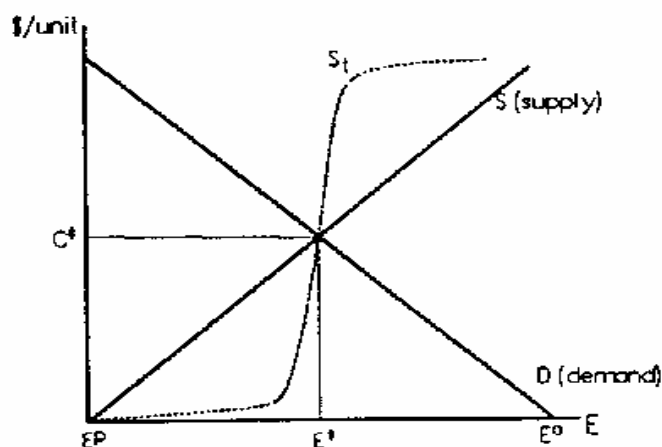
Thus, society quite validly insists now that the costs associated with any adverse environmental impacts of mining activities be taken into account, along with the benefits. Failing to account for those costs, as pointed out by the ACF (sub. 68, p.11), "represents a subsidy paid from the stock of environmental capital."

Comparing costs and benefits

Simply stated, justifying the costs associated with a given level of environmental damage requires showing that the (social) benefits derived from the activity causing that damage outweighs the (social) costs. The proper way to carry out such an analysis is illustrated in Figure 7.1 which plots the supply - or incremental opportunity cost associated with the use of environmental services - and demand - or the incremental benefit associated with the use of the environment - for environmental services. The concept of demand and supply curves for environmental services used in Figure 7.1 may seem odd, but it is a concept widely used by economists and also accepted by groups such as the ACF which suggested (Transcript, p.551) that,

[Once it has been decided to proceed with a mining venture], as part of that venture, wastes are produced and within the air, water and land we would like to see that - the ideal economic solution would be to derive a supply curve, a cost curve, for the environment resources that are provided and to see that the appropriate price is charged for that.

Figure 7.1 Demand for and supply of environmental services



Relating the use of the environment to the supply and demand for environmental services highlights the crux of the interaction between mining and the environment, that is, that the resulting environmental disturbance is not the product of deliberated wrongdoing but a regrettable part of a socially useful activity. However, this does not mean that any level of environmental disturbances is acceptable. In fact, efficiency occurs only when incremental social costs and benefits are equal. This level of environmental disturbance is shown as E^* in Figure 7.1 and represents the best society can do.

In general, a socially efficient allocation of environmental services usually means that both mining and other activities share services provided by the environment (but not necessarily at the same location). For mining-related activities, this may imply restricting their overall use of the environment below the level where private gains are maximised. For non-mining activities, it implies accepting use of environmental services by mining activities and thus forgoing a totally pristine environment - an unattainable objective anyhow.

7.4 The importance of well-defined property rights

The potential importance of well-defined property rights to such environmental services as potable water, breathable air, and scenic views can be illustrated in the context of this inquiry by the following example. (The importance of property rights in other aspects of mining-related activities is examined in Attachment 2A).

In many areas, miners have the right to enter a rural property to conduct mining-related activities (such as exploration) without the owner's consent. The level of disturbance caused while conducting such activities can be objectionable to farmers. An example is noise pollution which can be a particular problem because cattle are sensitive to it.³ Ill-defined rights to low or zero-noise levels could encourage miners to gamble that, given that the adverse effects of noise pollution on cattle are difficult to measure (let alone establish causality with respect to the source), farmers

³ See evidence by Dr. J. Blackshaw (Transcript, p.946-8) and the submission by the Landholders Association (sub. 8).

would consider suing for damages a too risky and potentially expensive course of action to pursue. In the absence of any real threat of legal action, miners would have little incentive to offer compensation or implement noise abatement strategies. The result would be that farmers may have to bear all the cost of any noise-induced damage to their cattle.

Thus an important perspective on conflict between miners and others over access to such environmental services as an absence of noise or clean air and water can be analysed in terms of who is allocated (or possesses) the relevant property rights (and the extent to which such rights are enforceable). Allocating property rights is critical, because whoever is denied these rights normally has to incur the costs of preventing (or mitigating) any damage. Society has taken an important step in this direction by invoking the 'polluter pays' principle.

The polluter pays principle

The *de jure* assignment of the property rights is important to any society - and a full specification of such rights would include who should hold them in respect of services provided by the environment.⁴ In practice, it has become widely accepted that no one should have unrestrained access to certain services provided by the environment as of right and that those who use such services (or deny them to others) should pay for that privilege. This approach to the problem of assigning liability for use of the environment is referred to as the polluter pays principle.

This principle, as its name suggests, specifies who should pay for overusing environmental services. But at what stage overuse of the environment starts to occur (ie the point at which the environment's ability to provide services becomes strained) is a moot point. Purists would maintain, for example, that the natural state of the environment is most desirable so that such a presumption would therefore have the 'polluter' paying for any costs involved in disturbing that (pristine) state. Others argue that the environment is clearly capable of providing a certain amount of services indefinitely (without jeopardising its resilience) and that therefore polluters should only start paying when various thresholds in respect of particular services - such as provision of air of an acceptable quality and potable water - are starting to be approached.

Charges to cover use of services provided by the environment under the polluter pays principle can be levied in a variety of ways. For example, under a 'command-and-control' system the charge usually involves covering whatever it costs to conform to a given standard, while under a market-oriented system it may involve paying an effluent fee.

The polluter pays principle has been widely accepted by governments in Australia. For example, according to the NSW Government (sub. 52, p.42), "Consistent with the 'polluter pays' principle, industry must bear the costs of any necessary measures, if in fact extra costs are involved." The polluter pays principle seems to have been accepted by the mining industry as well. For example, the Australian Petroleum Exploration Association states (APEA, sub. 4, attach. 1, p.21) that, "APEA accepts the concept of 'polluter pays', but maintains that such a principle is in reality 'the polluter complies and the consumer pays.'"

⁴ This problem, like most equity-related issues, cannot be resolved by economists.

Concerning who bears the costs associated with invoking the polluter pays principle, it should be mentioned that in the case of traded goods like minerals, prices are determined in international rather than domestic markets. Thus increased production costs resulting from using the polluter pays principle will likely be translated in lower profitability rather than higher prices. As stated by SX Holdings (sub. 5, p.2):

An export oriented industry will potentially be disadvantaged if it has to provide higher environmental standards, labour rates or taxes than its competitors. We must accept that there will be industries where we in Australia cannot compete since we are unwilling to either damage the environment or the workforce.

Of course, discouraging mineral activities by charging them for the environmental damage they cause may in fact be economically efficient. In other words, the polluter pays principle may promote the efficient allocation of resources by making some activities uneconomic. This mechanism is analogous to what Pearce et al (1985) referred to as the "green power of market forces."

The polluter pays principle solves the important problem of who should pay the cost of reducing the use of environmental services when such usage is judged to be excessive. The principle gives those affected by disturbing activities the legal means to remedy the imbalance and makes the disturbing party accountable for the costs associated with rectifying that imbalance. However, in practice, the polluter pays principle may not be consistently applied across all activities. For example, according to the Coronation Hill Joint Venture (CHJV, sub. 27, p.19):

Examples of where government bodies are not complying with the same standards demanded of the CHJV range from the relatively minor failure to properly dispose of rubbish by the OSS [Office of the Supervising Scientist] to the more serious which includes major erosion caused by the construction or upgrading of roads and tracks which have involved the indiscriminate clearing of large areas of land and fording of the South Alligator river and its tributaries. These have been done by both the ANPWS [Australian National Parks and Wildlife Service] and by buffalo catchers working on contract for the ANPWS. Conversely, CHJV access to these leases has been rigourously monitored and has been primarily limited to existing roads and tracks.

The point here is not that mining should be exempt from strict (and even possibly unique) controls as a result of applying the polluter pays principle, but that restrictions applying to other activities with the potential to cause similar environmental damage should be equally strict (and enforced).

The user pays principle

There is usually some trade-off between costs and benefits of particular economic activities - and therefore some 'optimal' level of pollution of the environment which it is in society's best interests to put up with (level E* in Figure 7.1). However, merely invoking the polluter pays principle may not achieve that optimum. This would be the case, for example, if the presumption on which charges are based is that any pollution is bad, whereas the reality of the situation is that some

(perhaps unknown) level of pollution can be tolerated. In other words, while moving from a pristine state (E_p in Figure 7.1) or from an excessively disturbed environment (E_o) towards the social optimum (E^*) is essentially a symmetric problem, the polluter pays principle may well provide asymmetric incentives. If this is the case, mining activities are liable to be disadvantaged and society unlikely to achieve the best use of services provided by the environment.

Any potential problems just discussed can be avoided by ensuring not only that the beneficiaries can compensate the losers in principle, but that actual compensation is paid. This is akin to invoking the user pays principle.

Under this principle, all users of environmental services should be charged an amount equal to the opportunity cost implied by their use of such services. Thus while mining activities should pay the opportunity cost of the environmental services they use, other users whose use of the environment precludes mining should be made accountable for the net mineral revenue (or economic rents) forgone by society at large. A mining-precluding activity which does not generate a net social benefit at least equal to the forgone net mineral revenue is not socially desirable. The main consideration in arguing that the user pays principle be applied equally to mining and non-mining activities is to make explicit the opportunity cost of non-mining options.

7.5 Non-government allocation of environmental services

A predominantly market economy such as ours relies to a significant degree on the operation of normal market forces and the exercise of private property rights to allocate resources efficiently. Many environmental 'problems' could also be efficiently resolved by private transactions.

Opportunities for direct interaction between parties competing for the use of particular environmental services are illustrated here using two examples drawn from material presented to this inquiry. They illustrate that there is often scope to resolve conflict over use of services provided by the environment by invoking market-like arrangements through a process of bargaining between affected parties or by mergers. Note that the role of the government is confined in the main to that of any resource owner and, thus, is not classified as government intervention.

Bargaining

A good example of the scope for bargained solutions to environmental trade-offs is provided by the process leading to the establishment of conservation reserves in the Northern Jarrah Forests of Western Australia examined in Part I. According to evidence submitted by Alcoa:

Successful resolution of the land reservation issue required Alcoa's acceptance that conservation was a priority land use for a significant proportion of the principal bauxite area. It also required 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. By this process, the integrity of the 'core' conservation areas was maintained, the total area finally agreed was slightly larger than the initial EPA [Environmental Protection Authority] recommendations, and Alcoa retained access to nearly 40 per cent of the bauxite within the initially proposed boundaries.

The agreement included other provisos that required compromises in others areas. For example, while Alcoa committed itself not to mine in the agreed conservation areas, it retained the right to cross certain areas with a conveyor if necessary to access ore reserves isolated by the conservation areas.

The evidence provided to this inquiry suggests that the compromise reached accorded reasonable protection to the conservation values in the area, while allowing exploration of most of the minerals. However, whether the trade-off achieved resulted in the most socially efficient allocation of resources cannot be ascertained because the outcome may have depended more on the relative bargaining power of the parties involved than on efficiency considerations.

In general, provided the number of individual involved is small, allocation of scarce environmental services may be handled by direct arrangements between those individuals. Those arrangements may take a number of forms which are characterized as requiring little government intervention.

Mergers

Another method to solve externality problems consists of merging the parties associated with the externality. The result is what economists call 'internalisation of externalities'. The practical potential of mergers is demonstrated by an example provided by Coal and Allied Operations (Transcript, p.1741):

In the Hunter Valley the attitude taken by the coal industry virtually from about 1975 onwards was that certainly as far as Coal and Allied operations were concerned we acquired all the surface land, not only the surface land that is strictly within the mining lease but we also in many instances bought the adjoining properties. I might add that there was no lack of enthusiasm to sell because the land that we were buying was not of a highly productive nature. When you start to talk of a beast a hectare, it is not the best country in Australia, and there was certainly no reluctance to sell.

... Having acquired the land what we then did was through the appointment of an environmental officer that actually in a former reincarnation was with the Soil Conservation Services - he joined us and we have actively, if you like, managed the properties that are on the immediate mine site adjoining the mining operation. We managed those ourselves and run our own herd of cattle with our own employees.

As mentioned before, cattle are sensitive to noise pollution and the presence of strangers. Thus, mining operations have the potential to have harmful effects on cattle in adjoining properties. This has led to acrimonious disputes between miners and farmers as described previously. In this regard, it was added (Transcript, p.1741) that:

The areas which are not, if you like, in the immediate range of mining activity, and I would suggest that they are the areas that may be at least 2 years off, in many instances were leased back at nominal rental to the people who we bought it from. In many instances we bought dairies and leased the dairy back to the person that we bought them from, and in other instances what we have done is - by amalgamation we have been able to run, if you like, some unprofitable properties into probably what is the largest single dairy quota in the Hunter Valley. We are, as Coal and Allied, one of the largest dairy operators in the Hunter Valley.

A key to the success of this approach appears to be the fact that both miners and farmers had property rights that they could trade to reach a mutually satisfactory solution.

The previous examples described instances where no government intervention was required to decide the allocation of environmental services. However, there are other cases when government intervention is justified. The following section analyses those cases.

7.6 Rationale for government intervention

The Crown's ownership of minerals has meant that the interaction between mining activities and the environment has never been entirely determined by private transactions and free markets. That interaction, and in general the operation of mining activities, have always been to some extent under the control of governments which, as the owners of the minerals, have the right (and some would argue the duty) to specify the conditions under which the exploitation of minerals is to take place. Thus, the excessive past levels of environmental disturbances acknowledged by the mining industry and denounced by other groups can be attributed in part to a failure of government regulation.

Notwithstanding its past apparent shortcomings, the conclusion that government intervention is required today to allocate some environmental services seems inescapable. That intervention is justified by two factors: externalities and high transaction costs.

Externalities

Well functioning markets provide producers with a powerful incentive to minimize costs. But in attempting to minimize costs, producers are given also an inducement to try to pass costs to other parties if possible. For example, in the case of mining activities, the extraction and sale of ore involves agreements between mining companies and the owners of factors of production such as labour and capital. However, it often does not include agreements with parties affected by such activities as the disposal of unsalable by-products (pollution) in rivers or the atmosphere. Thus mining companies may have no compelling reason to take these 'environmental' costs into account. Those parties are external to all agreements mining companies normally enter when extracting ore, in spite of the fact that the those parties are directly affected by mining activities. This effect on parties not directly involved in market agreements is called an externality.

The problem with externalities is that they cause free markets to misallocate resources. The full cost of mining activities includes their effects on the environment, but firms undertaking such activities have no incentive to take into account those external costs.

Transaction costs

Something of a paradox emerges from the discussion concerning bargaining and that about externalities, namely, why should externalities arise at all if a bargained solution seems always to be possible by assigning one party (eg the disturbing party) the de facto property rights to disturb? Thus, for example, why should it be believed that environmental disturbances produced by mining and affecting farming are a social problem given that farmers have always had the socially efficient option of subsidizing (bribing) miners to decrease the impact of their activities?

Apart from the equity issues raised by what would be the arbitrary assignment of rights, the answer lies in the fact that high transaction or bargaining costs may prevent those affected by mining activities from taking effective action. In particular, it is widely accepted that transaction costs rise steeply as the number of parties involved increases, even if explicit property rights exists. The problem is not difficult to visualize with reference to the examples of water pollution affecting traditional Aboriginal communities and other groups described in section 7.2. In such cases, the costs of having each of the sufferers from effluent discharges negotiate with the mining firm would be such that bargaining may not occur even with clear and explicit property rights in existence. The problem is compounded considerably when more than one source discharges effluent into a system, because determining responsibility in the presence of threshold and synergism becomes extremely difficult.⁵

Thus, in practice, when the use of environmental services by mining activities is associated with externalities and involves large numbers of affected parties, government intervention is required. Such intervention can take numerous forms that may be classified in two general groups: market-oriented and 'command-and-control' approaches.

7.7 Types of government intervention

There are several market-oriented mechanisms that the government can employ to allocate environmental services, including liability at law, effluent charges, subsidies, and transferable pollution permits. 'Command-and-control' mechanisms include prescriptive regulations, emission standards, technology-based standards, and outright prohibition. These forms of government intervention are examined in detailed in Attachment 7B. Only their main practical implications are discussed here.

Before discussing those implications, however, it should be mentioned that government intervention must always include safeguards against systematic evasion, by requiring continuous or unpredictable periodic checking. In this regard, monitoring by departments traditionally close to the mining industry and responsible for royalty collection creates opportunities for conflicts of interest between maximizing royalty collections and monitoring environmental disturbances. The second objective may require taking measures affecting the first. Therefore, it is suggested that an organization independent from mining undertakes the monitoring work.

⁵ See Attachment 7B for a discussion of thresholds and synergism.

Market-oriented intervention

Market-oriented mechanisms have three main advantages:

- they may involve little or no need for government to set and implement standards for individual users;
- they can allocate the use of environmental services to firms or individuals that derive the greatest benefits from that use; and
- they provide greater incentives to innovate than a 'command-and-control' system.

There are various disadvantages associated with market-oriented mechanisms, though:

- they may result in different disturbance sources producing different pollution levels, thus creating a complex monitoring task;
- incentives to falsify performance may be greater than under 'command-and-control' systems; and
- there is limited operational experience using them.

The last shortcoming is of special concern to this inquiry because it makes difficult to determine under which conditions the theoretical advantages of market-oriented mechanisms will be realized in practice. What must be avoided is a circular reasoning whereby policy makers refuse to implement market mechanisms until there is operational experience - which will not be forthcoming unless those mechanisms are tried in the first place. Thus, it is suggested that an incremental introduction of market-oriented mechanisms be considered at selected locations and dealing with a limited number of environmental disturbances. This should provide the necessary operational experience in their use and insights into the type of problems they can more readily help to solve.

It is important to emphasize the positive effects of market-oriented systems on innovation, compared to 'command-and-control' systems. Even if the two approaches were comparable in other respects, implementing market-oriented mechanisms would still have the significant advantage of encouraging adoption of new technologies to meet environmental requirements. Section 8 demonstrates the crucial role that technological innovation has played in other aspects of mining and minerals processing activities.

Command-and-control intervention

The two main advantages of 'command-and-control' mechanisms vis-a-vis market-oriented ones are that:

- their use makes more certain that the use of the environment will not go beyond a threshold level, and

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- when prescriptive, are relatively easy to enforce because compliance can be verified merely by determining whether the required structure or device has been built or installed and is operative.

There are numerous disadvantages associated with their use, however. Command-and-control mechanisms:

- require determining individual pollution standards for each disturbance source;
- tend to conceal the cost of compliance and this may leave policy-makers free to ignore real costs and constraints when setting environmental standards,
- may lead to increased pollution when an expansion of the disturbing activity occurs even if the controls are effective;
- provide users with little incentive to innovate (and even good reasons to hide potential innovations from the control authority);
- are arbitrary especially if they are technology based; and
- if uniform, take little consideration of differences in the costs and benefits of complying with the standards, all of which are site-specific.

The current prevalence of 'command-and-control' forms of government intervention can be explained in part by their relative ease of administration. But their use - especially when they take the form of prescriptive regulation or prohibition - may have also been influenced by other considerations, including the desire of policy makers to be perceived as doing something tangible about environmental problems, the attempt by some mining-related firms to avoid accountability for the social cost of the environmental services they require, and the wish of some non-mining groups to hide the real cost to society of precluding mining at certain locations.

Many of the disadvantages associated with 'command-and-control' mechanisms can be minimised by the use of emission standards instead of the prescriptive regulations frequently favoured in the past. Emission standards are relatively flexible in dealing with control technology, allow sources to search for the least expensive combination of changes in inputs, process, and end-of-process controls to meet standards, and allow the source to search for technological innovations and adopt them immediately. On the other hand, emission standards share a major disadvantage with many market-oriented mechanisms in that they are difficult to enforce because they require the monitoring of actual emissions.

Given the uncertainty about costs and benefits, all forms of government intervention must proceed indirectly and imperfectly. In fact, the most compelling argument for mechanisms such as emission standards is based on the observation that only one error is involved in setting those standards while two are involved in setting mechanisms such as effluent charges. Specifically, once a social goal is determined, its attainment involves only setting that goal as standard and enforcing it. A system based on standards may set a wrong goal but will attain it. On the other hand, a charge system may either have a wrong goal or fail to attain the right one.

7.8 Valuing the environment

Underlying much of the previous discussion is the assumption that it is possible to value services provided by the environment, because government intervention usually requires first determining the value of forgone environmental services associated with an activity. The problems associated with valuing the environment are examined in detail in Attachment 7C. This section only highlights the main findings.

While undoubtedly difficult, the monetary value of environmental services needs to be determined, at least approximately, if informed and rational decisions are to be made about allocating scarce environmental services. A number of alternatives, such as direct demand-revealing, travel cost, and hedonic methods exist to estimate that value. The resulting estimates are often characterized by significant uncertainty, which derives in part from the often limited knowledge available about the physical effects of different forms of environmental disturbances, and the cost they impose on society. Note, however, that uncertainty characterises many decisions - so that ultimately there is no fundamental difference between valuing the environment and other resources.

Uncertainty about the true costs and benefits associated with the use of the environment is not the only factor making valuing the environment and deciding on its best use difficult in practice. In this respect, several participants expressed grave concerns in relation to irreversibility. However, as Gordon (1981) has pointed out, the concept of irreversibility in the analysis of environmental problems seems to be peripheral because irrevocable allocations of scarce resources are made regardless of what action is taken concerning environmental disturbances.

Participants also expressed reservations about the role that lobbying plays in deciding on uses of the environment. The possibility for conflict when different groups demand possibly incompatible environmental services at the same location is obvious. Several participants expressed concern that the environmental movement has elements which constitute an unrepresentative elite concerned more with protecting their own position than with the general welfare. On the other hand, conservationists considered the lobbying efforts of mining-related groups as 'confrontationalist' and 'propaganda'. In this antagonistic context, reaching agreements on the value of environmental services and their allocation is difficult. This is particularly true because both costs and benefits can be identified with the activities of all groups with competing claims on the use of those services. The problem is compounded by the fact that the government itself has its own particular goals.

In the final analysis, neither miners nor other groups with interests in a particular allocation of environmental services can claim that they alone represent the true interest of society at large. Government intervention has provided only a partial solution to that conflict. It appears that an agency independent of either the mining industry, conservationists, or the government would be in a better position to arbitrate in the allocation of environmental services between mining and other activities.

7.9 The cost of delays

The process of taking into account environmental concerns requires resources that society must divert from other uses. Hence, it is important to ensure that such a process is conducted as

efficiently and speedily as possible. This does not seem to have been the case in a number of past occasions, Coronation Hill (see section 21) and Ranger being two examples. It is critical to realise that, regardless of any other costs that may be incurred, the mere delaying of a project while environmental concerns are being addressed may result in a net loss to society (see Appendix E of Volume 2).

For example, Box 7.1 shows that if production at Ranger had started in 1977 rather than 1981, the value of royalty-type payments would have increased by about \$39 million. This is a significant forgone benefit because, unlike most taxes, those payments represent a net gain to society and not only a transfer of income (see section 14). Note that in the case of Ranger, delaying production may have had a particularly negative effect, because uranium prices have fallen almost continuously since 1978. Thus, the delay prevented realising additional benefits from the high uranium prices prevailing during the late 1970s and the loss described in Box 7.1 may underestimate the real cost to society.⁶

While most mining project are clearly not justified on the basis of short-term price movements alone, being able to react quickly to take advantage of favourable market conditions by speedily bringing new mines or processing facilities into production can confer competitive advantages. It is important to ensure that government intervention associated with environmental concerns does not unnecessarily diminish that advantage.

7.10 Exploration and rehabilitation

The evidence provided to this inquiry reveals two areas of special importance to many participants: exploration and rehabilitation. Exploration is analysed only in relation to the cost-benefit framework developed in this section. Other important considerations are examined in Part I.

Exploration

Various participants in this inquiry expressed strong reservations about the value of undertaking exploration in certain areas such as national parks. The cost-benefit framework previously discussed suggests that exploration is necessary so that a benchmark for judgments about the relative worth of the 'no development' option can be established.

⁶ That loss may have also been underestimated by the assumption that all mineral rents accrue to the government or Aborigines. As discussed in Section 14, part of the mineral rent is likely to accrue to the operator of the mine. On the other hand, the delay costs estimated in Box 7.1 may be offset by such hard to quantify gains as a more adequate protection of the environment. The issue would then be whether such protection can be achieved in a less dilatory form.

Box 7.1: Estimating the cost of delaying Ranger

Ranger is an open pit uranium mine owned by Energy Resources of Australia (ERA) which has operated within Kakadu National Park in the Northern Territory since October 1981. The nominal annual capacity of the mine is 4500 tonnes of concentrates (U₃O₈). It has proved reserves of 32 000 tonnes (contained U₃O₈) plus probable reserves of 63 600 tonnes (Greenpeace Australia, sub. 25, p.56). The average annual production rate of concentrates was 2801 tonnes during the period 1982-1989 (ERA, sub. 57, Table 1).

The likely environmental impacts of Ranger were the subject of close scrutiny before production started and have been continuously monitored by the Office of Supervising Scientist (see section 24) According to a paper submitted by the Northern Territory Government (sub. 77, attachment F), "The Ranger project production was delayed by four years from 1977 until 1981." This is attributed (sub. 77, p.24) in part to the "lack of consistency in the Commonwealth's policies" and "convoluted administration and unpredictable decision making processes."

An estimate of the social cost of the alleged delay of the start-up of production at Ranger can be obtained from the royalty-type payments made by ERA (sub. 57, Table 4) to the Northern Territory, the Northern Land Council and the Aboriginals Benefit Trust Account. Together, they represent the total mineral royalty associated with production at Ranger. That royalty accrues as a stream of benefits to society during the life of the mine. Their average annual value was \$18 million during the period 1982-89 (all money values in 1989 dollars).

A once off equivalent to the stream of royalties can be obtained by computing the present value of that stream. That present value was estimated by assuming that all proved reserves plus 75 per cent of probable reserves are ultimately mined. Both the annual royalty payments and production rates were assumed to be uniform and equal to the observed 1982-89 averages. A real annual discount rate of 3 per cent was used.

Two present values were obtained: the first assumed production starting at the end of 1977, the second at the end of 1981. In the first case, the present value was estimated to be equal to \$347 million; in the second, to \$308 million. Thus, the delay decreased the value of the royalties accruing to the community by about \$39 million (\$53 million if a discount rate of 6 per cent is used).

Some participants suggested that exploration be conducted prior to the establishment of a conservation area but that it ceases afterwards. This appears to be only a partial solution because, as argued in Section 8, technological progress often calls for the reassessment of previously explored areas. Or, as stated by the Queensland Chamber of Mines (sub. 74, p.14-15):

Because an area has been explored or mined previously does not mean that it no longer harbours valuable mineral resource. Mineral exploration is a dynamic and ongoing activity.

A 'once off' coverage of an area may not necessarily reveal its mineral resources.

Exploration technology and techniques change and improve; commodity targets vary as technology develops new uses for minerals; variations in commodity prices or local infrastructure mean the economic viability of a particular mineral deposit may alter substantially with time. Land use planning *must* have the flexibility to accommodate these variations.

It should be emphasized that access to exploration acreage should be contingent on the existence and effective enforcement of proper environmental guidelines.

Rehabilitation

Rehabilitation is an attempt to restore an area disturbed by mining such that it is compatible with the surrounding area. This requires resources that could be used for other activities and thus has a social cost.⁷ Of course, rehabilitating former minesites does not only entail costs but also benefits to society in the form of recovered fertility or elimination of unsightly features. The need for reclamation is acknowledged by, among others, AMIC and AMEC. The latter states (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, the evidence regarding the success of rehabilitation programs is often contradictory. On the one hand, The Environment Centre (of the NT) argued (sub. 56, p.4) 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 is that suggested by evidence provided by Coal and Allied 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 Chamber of Mines, Metals and Extractive Industries (NSW) provided evidence (sub. 124) of three cases - Bridge Hill Ridge (NSW), Crowdy Bay National Park and Pilbara Iron Ore Industry - where rehabilitation attempts are said to have.

A good example of the conflicting evidence received by this inquiry concerning rehabilitation is provided by the rehabilitation work in the Jarrah Forests of Western Australia which overlay bauxite deposits. On the one hand, the ACF argued (Transcript, p.551-2) that:

... there are instances, often quite serious ones, where the actual impact of mining and its associated infrastructure and also the precursor activities, mining exploration and so on, do really have a major impact on natural areas, ... the Jarrah Forest in south-western Western

⁷ ARCO suggests (sub. 64, p.8) that "... reclamation of strip mined areas to present industry standards costs about \$12 500 to \$15 000 per hectare without allowing for the capital equipment applied to the process." The NSW Coal Association estimates (sub. 45, p.21) the cost of land rehabilitation at an average of around \$12 000 per hectare.

Australia, for example, is a region of outstanding biological significance and it has been very adversely affected by a range of land-use activities, one of which was bauxite mining which although confined to a relatively small proportion of the land area, is extensive in the sense that it occurs throughout a large area; that is, the mining pods occur on the small patches of land but within a large area of forest. The ecological impacts which flow from that are recognised as having been very, very extensive.

On the other hand, the inclusion of Alcoa in the United Nations Environment Programme's Global 500 Roll of Honour for Environment Achievement for its work in rehabilitating the West Australian Jarrah Forest attests to the quality of Alcoa's work in that area.

In general, the major obstacle to determining the success of rehabilitation is defining what is to be understood by successful. If successful rehabilitation requires restoring a site to exactly the state prevailing before mining, all rehabilitation projects would probably fail the test. As acknowledged by G. S. McDonald (Transcript, p.39), President of AMIC, "[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 than it was originally."

On the other hand, if success is to be understood as a reasonable compatibility with the surrounding environment, there is probably no reason why modern rehabilitation techniques should not prove to be generally successful. In any case, the fact that the before and after-mining states of nature may not be identical does not constitute an argument against mining. That difference is simply part of the cost of undertaking mining projects and does not require special treatment as long as it is included in the project evaluation. Society may well decide that the cost of an environment which has been permanently changed by mining, but perhaps still productive in alternative uses, is more than compensated by the benefits derived from mining. What rehabilitation can do is to reduce that cost and perhaps justify a mining operation that would otherwise be unacceptable.

Ensuring that proper rehabilitation actually takes place can be a problem in some cases because most rehabilitation costs need to be incurred as the mining-related project is being wound down or has already ceased. Under those conditions, miners may find it difficult to finance rehabilitation if funds have not been put aside beforehand. The suggestion by the Nature Conservation Council of NSW (sub. 50, p.8) that:

To ensure that rehabilitation restores the environment to its pre-mining/exploration condition the mining company should be required to pay a security deposit. The security deposit must be large enough to cover the cost of rehabilitation and be a genuine loss to the company should they fail to rehabilitate.

is probably the best way of guaranteeing that rehabilitation is carried out. In this regard, see the discussion concerning liability, especially bonds, in Attachment 7B. (The tax treatment of rehabilitation costs is discussed in Section 13.)

7.11 Conclusions

The environment provides indispensable services to the mining industry (as indeed it does to most economic activities). When other activities require the use of those same services, an allocation mechanism may be required to ration those services among competing users. This problem is, in principle, no different from the allocation of other scarce resources; such an allocation has proved in practice to be best achieved through the direct interaction of individual owners and users. Thus, the Commission recommends that in the first instance an efficient use of environmental services be sought through the allocation of property rights and the consistent application of the user pays principle to mining and non-mining activities.

Yet, there is evidence that markets may be unable to achieve a socially efficient allocation of environmental services, even if property rights are well defined. This is likely to occur when externalities and high transaction costs are prevalent. In this case, government intervention is required. That intervention may take two forms: market-oriented and 'command-and-control' approaches. Notwithstanding the lack of operational experience associated with its use, the first form has numerous potential advantages over the second. Hence, it is recommended that an incremental introduction of market-oriented mechanisms be considered at some locations and dealing with a limited number of environmental disturbances, to replace or complement the 'command-and-control' mechanisms currently favoured.

The use of 'command-and-control' mechanisms alone may be required when it is important to ensure that a threshold level is not exceeded, or when compliance is difficult to monitor. When such mechanisms are deemed necessary, emission standards rather than prescriptive regulations should be preferred. It is emphasised that, compared with market-oriented mechanisms, 'command-and-control' allocation forms of government intervention are likely to be less efficient and significantly less transparent, for they tend to hide the real costs of achieving a given level of environmental quality. Regardless of the specific mechanism involved, monitoring is essential and should be undertaken by an organisation with no close association to the mining and mineral processing industry, so as to avoid conflicts of interest.

All forms of government intervention need to be expeditious and flexible. At each location, it is necessary to determine the total social benefits and costs associated with a specific mining proposal. Obviously, this can only be done if society can actually assess the value of the minerals in the ground through exploration. Independently of what ultimately may be decided about mining, the need for exploration is a precondition for making informed decisions. Thus, the Commission recommends that exploration be allowed everywhere under proper guidelines.

The analysis of the allocation of environmental services is particularly arduous because of the lack of conclusive scientific evidence about many of the effects of various activities on the environment and the inadequate operational experience using several mechanisms to allocate environmental services. Moreover, environmental problems often involve difficult ethical questions for which a pluralist society naturally provides a great diversity of answers. Questions arise in relation to issues such as intergenerational equity and the social good vis-a-vis the rights of individuals - that are well beyond the scope of this inquiry. Yet answering those questions is essential to providing a comprehensive answer to environmental problems. Hence, the analysis in this section must be

considered as a first step in the process of arriving at satisfactory solutions to environmental problems, rather than as a definite answer to those problems.

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7A INTERVENTION: LEGAL FRAMEWORK

The use of environmental services by mining-related activities is regulated by legislation enacted by both State/Territory and Commonwealth levels of government. In the past, State regulations played a central role. However, the importance of Commonwealth law has increased considerably in recent years and may become the predominant form of regulation. The largely unco-ordinated expansion of State and Commonwealth regulations seems to have led to excessive complexity which can hinder the efficient allocation of environmental services.

7A.1 Commonwealth involvement

Legislative control over mining and mineral processing is, in principle, the responsibility of the individual State and Territory governments. However, the Commonwealth Government has been able to exercise control over the environmental impacts of mining by using its constitutional powers over exports, trading corporation provisions and external affairs. According to Hayes (1988), the Commonwealth has the de facto ability to legislate in relation to environmental issues within a State, whether those issues are of national or international importance.

The requirement for Environmental Impact Statements (EIS) derives from the *Environmental Protection (Impact of Proposals) Act 1974* introduced by the Commonwealth and replicated by Acts in all States, except Western Australia, in the form of State Environmental legislation. The Environmental Protection Act provides the Commonwealth with the power to order an EIS or an inquiry to be undertaken in cases where there is some federal involvement. The inquiry provisions of the legislation were used only twice during the first five years of the legislation's operation namely, Fraser Island and Ranger Uranium, but both had significant implications for mining.

After two reports, the inquiry into mining on Fraser Island recommended against issuing export permits. This effectively banned mining in that area because its financial viability depended on access to foreign markets. The inquiry into mining of uranium at Ranger recommended that mining be allowed, provided proper safeguards were adopted to protect the environment and the aboriginal communities affected. Subsequently, the Commonwealth was able to use the export powers it had employed to prevent mining in Fraser Island to refuse an export licence for minerals on Moreton Island.

Another milestone in the involvement of the Commonwealth Government in environmental issues arose from the Franklin Dam case which, according to Hayes (1988, p.324) "established the ability of the Commonwealth government, through its constitutional powers, to effectively determine land-use priorities within a State." The Commonwealth exercised its overriding powers by proclaiming the region a World Heritage area. This allowed the Commonwealth to appeal to its external affairs powers, especially its obligation to uphold international treaties, to prevent construction of the Dam. The High Court has upheld this action on appeal.

The Franklin Dam case was also important because it established the Commonwealth's powers to legislate with respect to trading or financial operations as a potential tool to address environmental issues. In relation to the Franklin Dam case, Zines (1985) noted that the "clear result of the case is that the Commonwealth may regulate and control all acts of trading and financial corporations done for the purpose of its trade. This includes all, or practically all, manufacture, mining, or agriculture performed by those corporations."

The Commonwealth has also used the *National Parks and Wildlife Act 1975* to regulate land use, and in particular mining which is now banned in Commonwealth National Parks. This Act has allowed the Commonwealth government to prevent mining in Kakadu National Park, although the proviso in that Act for 'conservation zones' has made possible mining by Ranger (whose area has been 'exercised' from the park). It has also opened the possibility of mining taking place elsewhere in that zone, including Coronation Hill.

7A.2 State involvement

Although regulation of mining activities by State and local authorities has usually had a less visible public profile than that by the Commonwealth, it is nonetheless at least as significant. According to evidence submitted by Oakbridge Ltd (sub. 32, attach.), in NSW there are at least 15 environment-related State Acts affecting coal mining alone.¹ Complying with statutory requirements can become quite intricate because in practice firms have to comply simultaneously with statutes at the local, State and Commonwealth level. This has led in many cases to what appears to be an unwieldy proliferation of regulations. For example, Energy Resources of Australia, operators of the Ranger uranium mine in the NT, claimed (sub. 57, p.39) that in "total there are eight Commonwealth and Northern Territory Ministries involved in the environmental aspects of Ranger and these are guided by 15 Commonwealth and 35 Northern Territory Acts with 45 specific environmental requirements under which Ranger has to operate."

Understandably, the mining industry finds the proliferation of environment-related legislation unnecessarily complicated and inefficient. According to the (NSW) Chamber of Mines, Metals and Extractive Industries (sub. 37, p.5):

In New South Wales the primary mechanism for public management of development and environmental protection is the Environmental Planning and Assessment (EPA) Act (1979) which has been in operation for a decade. Whilst it does include a mechanism for managing development approval and encouraging environmental protection, the Chamber considers this legislation to be unwieldy and complex, and believes it has patently failed to address the fundamental issue of responsibility.

¹ These include: *Bush Fires Act 1949*, *Clean Air Act 1961*, *Clean Waters Act 1970*, *Dams Safety Act 1978*, *Environmental Planning and Assessment Act 1979*, *Brigades Act 1909*, *Forestry Act 1916*, *Mines Subsidence Compensation Act 1961*, *Wildlife Act 1974*, *Noise Control Act 1975*, *Pastures Protection Act 1934*, *State Pollution Control Commission Act 1970*, *Soil Conservation Act 1938*, *Water Board Act 1989*, and *Wilderness Act 1987*.

Commenting on the controls under which the mining industry in Australia operates, Hayes (1988, p.361) has concluded that:

It is only when one embarks upon a review of environmental controls around Australia that it becomes apparent how enormously complex and in many cases ineffective these controls are over an activity such as mining. It is not difficult to determine the reasons for this complexity because mining as an activity and an industry has of course been going on for hundreds of years. Environmental control on the other hand is a phenomenon not only of this century but one could almost say of the last two decades. As such it has been necessary for legislatures to attempt to superimpose environmental controls over activities which had hitherto been governed and continued to be governed by Acts drafted many years previously. One cannot help but repeat Simon Molesworth's *cri de coeur* in his paper in 1985 already referred to [1985 AMPLA Yearbook, p.368, 392] dealing with the Victoria situation when he said:

"If legislation is confusing or ambiguous or impracticable people cannot be expected to fully or willingly comply with it. Some people will be ignorant of such provisions. Others will avoid entering the legislative maze. If the legislation is subject to criticism such as can be levelled at the Victorian Act, not only will the mining industry lose out, but so will environmentalists and the community at large."

7A.3 Conclusions

A growing number of environment-related statutory requirements imposed on mining activities by all levels of government seems to have resulted in excessive legislative complexity. It appears that the current level of environmental protection could be achieved at a lower overall cost by simplifying and ensuring better coordinating of State and Commonwealth regulations.

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7B FORMS OF GOVERNMENT INTERVENTION TO ALLOCATE ENVIRONMENTAL SERVICES

A combination of ill-defined property rights, high transaction costs and externalities may require the intervention of governments in the allocation of environmental services. Command-and-control methods are currently the prevalent way in which governments intervene in the allocation of environmental services to mining activities. However, convincing reasons were identified to believe that market-oriented systems should be used to progressively replace, or at least complement, command-and-control systems in the allocation of environmental services.

7B.1 Market-oriented

This section examines four types of market-oriented government intervention to allocate environmental services: liability, subsidies, charges and transferable permits.

Liability

This method to limit the impact of mining activities on the environment consists of establishing a system which allows victims to sue for damages. If firms know they must compensate victims, they will themselves calculate the cost of a reduction in disturbance and compare it with the amount they stand to save in reduced damage claims. The reduced damage claims will, themselves, be a measure of the benefits of reduced disturbances. Thus, additional expenditures on control will be made if the additional benefits it generates are greater.

According to evidence submitted by Stockdale Prospecting Limited (sub. 43, p.4), there is already an established system of compensation for land disturbance during exploration which usually operates on the basis of a dollar amount for each drill hole or trench. If agreement cannot be reached amicably the amount of compensation is settled at a Warden's Court hearing.

A liability system can make mining activities accountable for the cost of environmental services in two main ways:

- paying bonds to cover future liabilities, and/or
- taking out special liability insurance.

Bonds

Provisions for the payment of bonds are already included in Western Australia's Mining Act (sub. 48, p.3) "to ensure that 'injury to the surface of the land' is made good, if necessary for the costs of such work to be recovered from the tenement holder, and for the lodging of securities or bonds to cover mining operations on public reserves". Rehabilitation bonds are also required in New South Wales (sub. 52, p.44). DASETT also supports (sub. 65, p.15) the use of bonds as a means of ensuring that enough funds are available at the end of mining operations for rehabilitation.

A major difficulty with bonds is determining the amount to be posted. Using the most probable value of rehabilitation costs as the bond to be posted is inadequate because it ignores the small but real possibility of catastrophic outcomes. Including those outcomes could significantly increase the amount of bond required and create problems as groups with diverse risk preferences - miners, the government and, perhaps, conservationists - try to agree on the scenarios to be considered and their likelihood.

Failure to establish the value of a bond to reflect the expected social cost may require complementing such a bond with other mechanisms as suggested by the ACF (sub. 68, p.15):

As part of a package of measures the Industry Commission may want to consider class actions, criminal damages and punitive triple damages as methods by which the cost of environmental subsidies could be internalized.

The additional measures proposed by the ACF can all be characterized as market-oriented insofar as they provide incentives to reach a socially efficient level of use of the environment by increasing the expected cost of exceeding that level. However, it is preferable to correctly set the value of the bond in the first place. This requires estimating the value of the externalities involved. (See Attachment 7C for mechanisms to value the environment).

Insurance

Insurance allows several sources to pool their risks. This can be an advantage because not every mining operation will cause substantial environmental disturbances. Thus, an insurance pool would need only enough resources to cover the occasional significant event. The insurance premium of each individual mine would depend on the insurance company's assessment of the risk. This risk would be associated to the particular environmental characteristics of each site and mine operation. Better managed mines or those in less sensitive locations would pay lower insurance premiums. This would give firms engaged in mining activities incentives to be more careful and to locate in the less environmentally risky areas. (Mining firms cannot influence the location of ore bodies, but they can determine which bodies will be exploited).

According to Freehill, Hollingdale and Page (sub. 76, p.6) - a major law firm with an extensive resources law practice - using liability to solve environmental problems:

has led, among other things, to the practice of banks conducting environmental audits as part of the loan approval process, to determine the extent of past compliance and potential liabilities arising from past practices. It has also resulted in environmental protection being made a financial as well as a legal consideration in the conduct of ongoing operations. The level of new fines (for example under the NSW Environmental Offences and Penalties Act 1989) is intended to be a sufficient disincentive to ensure that they will not be absorbed by business as a minor cost of polluting, less than the external cost to the community.

Moreover,

Increased financial liabilities act as a deterrent to investors. Environmental factors affect the level of financial liabilities in the following ways:

- Legal liability - Strict or fault based, civil or criminal liability under statute or at common law. Possible personal liability of directors. Unlimited cover of these risks by insurance is unobtainable.
- Clean up or rehabilitation costs after an environmental incident can be significant.
- Business interruptions/loss of production can occur while operations are reinstated or upgraded to acceptable standards.
- Loss of markets (for example, the consumer boycott of Exxon after the Exxon Valdez oil spill).

Requiring a mining-related firm to carry insurance for financial liability appears especially attractive because it forces two well informed parties, that firm and the insurer, to evaluate the risk associated with a venture.

Limitations of liability mechanisms

Although a liability solution would reduce the need for government to enforce controls, a major difficulty is that liability can be extremely difficult to determine in practice if many different parties are involved. For example, it may be practically impossible to determine how much damage a smelting operation may do to the lungs of each individual living in the vicinity. Furthermore, Edel (1973) has suggested that although imposing liability requirements could reduce the work of government departments, the job of the judiciary may increase. Not only may judges have to rule on the extent of damages when they take place, they may also have to rule on lawsuits brought by individuals who are in fact not damaged, but who sue nevertheless, hoping to win something in the process.

Another problem is that substantial damage may need to occur for the effects of environmental disturbance to be uncovered. Unless mining-related firms are required to contribute to an ever increasing bond or insurance, they may gamble that the effect of their activities on the environment will not cause harm. This would allow them to reduce their costs at the time of production while at the same time accumulating a substantial potential liability. If they become liable, that liability is limited to the value of the posted bond or insurance policy. Downing (1984) has suggested that requiring a payment equal to the potential liability at the time of the production would solve this problem. Firms would then compare the benefit they get from disturbing the environment and the cost of the liability. If the liability accurately reflects the social cost of the potential damage, firms will be stimulated to make an efficient decision.

Subsidies

Subsidies granted to those who reduce their demand of environmental services can be designed to achieve optimum disturbance levels. From the point of view of resource allocation, the ability to subsidize a mining-related company to induce it to limit environmental impacts to a desired level makes this solution equivalent to charging that company for the environmental disturbance it causes.

However, there are various practical problems with subsidies. First, there is the equity issue. As usual, whether subsidizing or charging is more equitable depends on which party is wealthier. Yet, subsidizing mining activities to reduce their environmental impact violates many people's ideas of fairness in a way that charging according to the disturbance produced does not. A more important problem perhaps is that firms may have an incentive to expand their use of the environment in order to receive rewards later for reducing that use.

Effluent charges

Under the user pays principle discussed in section 7, mining companies should be charged for the use of environmental services. That charge can take the form of a fee per unit of environmental service used. By charging mining activities for the use of otherwise free environmental services, the government puts itself in the place of an owner, charging a price for their use. The fees are often referred to as effluent charge or pollution tax because the environmental service involved usually takes the form of waste disposal capacity.

Under a system of effluent charges, users that find it less expensive to reduce the use of environmental services will be the ones that decrease that usage first; when a user cannot continue to pay the environmental costs, it is forced to cease production. This releases resources to produce some other, more highly valued goods and is the socially efficient outcome.

Based on the European and Japanese experiences with effluent charges, Tietenberg (1990) has concluded that effluent charges have typically led to only small environmental improvements. (Those modest improvements seem to be due to the low level at which the effluent charge rate is set.) Gordon (1981) has also suggested that charges could be considered an undesirable addition to the tax system and that large inflows of money could encourage excessive government spending. However, the main difficulty with effluent charges relates to the complexity involved in setting and (continually) charging them.

Transferable permits

Given the practical difficulties of implementing a system of effluent charges, systems based on transferable permits have been suggested. As with subsidies and charges, transferable permits require first determining the optimal level of environmental usage and setting a standard at that level. Next, the number of units of environmental disturbance that can be allowed in order to achieve that standard need to be determined. Permits to use the environment may then be auctioned in an open market or allocated in some other way. The key to the efficiency of a transferable permit system is that after the initial distribution, permits can be traded. When buyers

and sellers agree on a price, the permit is transferred and the new owners of the permit can increase their use of the environment while the previous owners must reduce theirs. In principle, the system would also allow non-mining groups to express their preferences for an improved environment directly by purchasing permits and retiring them.

An example of an emissions trading system is that included in the US Clean Air Act. According to Tietenberg (1990) the American experience shows that tradable permits can reduce the costs of achieving a given environmental quality and induce the introduction of innovative control technologies. Downing (1984) also mentions the fact that the system does not require the setting and implementation of individual source standards. However, a potential problem arises if the use of the environment is characterized by threshold effects, such that allocating permits from one area to another could increase environmental damage even if the number of permits remains constant.

7B.2 Command-and-control

In the past policy makers have favoured the use of command-and-control systems. The following is a discussion of those systems. That discussion is preceded by an analysis of the threshold concept which has played an important role in rationalising the adoption of command-and-control mechanisms.

Many experts suggest that using environmental services may have different effects on the quality of the environment depending on the level of usage. At very low levels, the damages are negligible. As usage increases, adverse effects begin to appear. Their point of first appearance is called the threshold of damages. After this threshold is reached, damages increase rapidly until the environment is seriously affected. Assuming that the cost to society of using the environment is a direct function of the environmental disturbance produced, the supply curve for environmental services when threshold effects are present would be S-shaped.

Examples of threshold effects include trees surviving in smog below certain level of pollution and fish surviving in waters in which the dissolved oxygen is above a certain minimum. Neither survives beyond the threshold. A closely related phenomenon is that of synergism. For example, sulphur dioxide and certain kinds of atmospheric particulates are, together, hazardous for health at concentrations below the levels at which each on its own is dangerous. In this case, a threshold effect would arise if, say, particulates are already present in small concentration and a copper smelter then discharges sulphur dioxide into the atmosphere.

The threshold concept is implicit when the supply of environmental services is assumed to be represented by a vertical line (such as in Pearce et al, 1989). That line represents the threshold level. This shape of the supply curve is referred to as perfectly inelastic by economists and arises from the assumption that the supply of environmental services is fixed. This vertical supply curve is used by the ACF (sub. 68, p.5). An implication of a perfectly inelastic environmental supply curve is that it may lead to 'surprises' as environmental disturbances with initially negligible costs suddenly lead to major losses as the threshold is reached.

It should be noted that the existence of thresholds is not universally accepted. According to McGartland and Oates (1985, p.208) "such a formulation is unacceptable both in principle and at the policy level. There is little evidence of the existence of such thresholds for most air and water pollutants: some pollution typically yields some damages and somewhat more pollution results in somewhat more damages."

Standards

The presence of thresholds has been used to justify the imposition of standards so that environmental services are not consumed beyond the critical threshold. It has been proposed that in the presence of thresholds governments ought to rely on incentive schemes resembling quotas on the use of environmental services. Standards are more likely to prevent the use of the environment going beyond the threshold level than market-oriented mechanisms. That makes them attractive in extremely sensitive situations. This seems to be the interpretation that is typically used at the policy level. In the Environment Protection (Nuclear Codes) Act 1978, for example, the Commonwealth has explicitly instructed the setting up of standards for the mining, recovery and production of uranium and other radioactive substances 'for protecting the health and safety of the people of Australia, and the environment'. This suggests a model based on the existence of a threshold below which damages are negligible and above which the damages suddenly become unacceptably large. This in turn implies that there is little cost associated with disturbing the environment so long as the disturbance level does not exceed the standard (the threshold).

The existence of threshold effects is not essential to justify the imposition of standards. From an economic perspective, standards could be interpreted as the optimal level of environmental disturbance. (Thus, in the example illustrated in Figure 7.1 a standard could seek to hold the level of pollution as close to socially optimum E^* as possible.) The imposition of standards is in principle straightforward involving simply setting the maximum amount of disturbance that can be produced at the social optimum. Faced with this control, a firm will increase the disturbance it produces up to the allowed limit but, if implemented properly, not beyond.

Standards recognize environmental quality as a goal but are inadequate by themselves because they do not signal individual firms how much environmental disturbance they can produce. This requires determining which proportion of the optimal level each of the various sources should be allowed to contribute. This is equivalent to determining individual standards for each single source. Downing (1984) argues that this additional regulatory step may leave policy-makers free to ignore real costs and constraints when setting environmental quality standards. Under this system, they may be able to promise a clean environment by setting a strict standard for total disturbance because the real forgone benefit is not obvious until the control of specific sources is prescribed.

Prescriptive regulations

In practice standards may take one of two forms: prescriptive regulations and emission standards. A prescriptive regulation states that an emitting source must take a specific technical control action. The regulation does not require that this action actually limits disturbances. A case in point is the alleged request by the OSS to the Coronation Hill Joint Venture (transcript, p.642) that various structures be built to prevent erosion.¹ Those measures failed to avert erosion despite the fact that compliance with the regulations apparently occurred.

¹ This claim has been rejected by the OSS, see transcript, p.1326-1328.

Prescriptive regulations are relatively easy to enforce because compliance can be verified merely by determining whether the required structure or device has been built or installed and is operative. Thus, in the example above, the OSS had only to verify that the prescribed structures had been built.

A major disadvantage of prescriptive regulations stems from the fact that control technology is continually changing. When a more effective or less expensive device becomes available, it would be desirable to require its use. However, new devices usually require approval which may be a time consuming process. An equally serious problem is the fact that the installation and operation of a control device does not necessarily guarantee that total emissions will not rise when mining or related activities increase even if regulation is effective. For example, stipulating that smelters use a certain type of scrubber may reduce pollution to an acceptable level. However, when smelting capacity is increased, pollution will rise even if the stipulated scrubber is used. Maintaining the acceptable pollution level would require installing more effective scrubbers.

Emission standards

Emission standards require that environmental disturbances be controlled to a specific level but do not prescribe how this goal is to be reached. Emission standards have several significant advantages over prescriptive regulations. They are relatively flexible in dealing with control technology because the standard does not specify the form of technology to be used, only the desired level of effectiveness. This allows sources to search for the least expensive combination of changes in inputs, process, and end-of-process controls to meet the standard. It also allows the source to search for technological innovations and adopt them immediately. On the other hand, emission standards, like most market-oriented mechanisms, require the measurement of actual emissions which can involve obvious practical problems.

- Technology based standards

Frequently, the desired standards are considered politically unfeasible. In this case standards may not be based on economic efficiency but on technological feasibility. A technology based approach sets environmental quality standards according to what is technically possible. Perhaps the best known example of technology base standards is the requirement to employ 'best practicable technology' to reduce environmental impacts. For example, the NSW Government indicates (sub. 52, p.43) that its Trade Waste Policy "restricts the concentration of hazardous discharges to levels that reflect the latest practicable treatment technologies." And the Office of Supervising Scientist directs its work towards assessing "actual and potential environmental impact of mining in the Region and to advise on Best Practicable Technology for these operations." (sub. 59, p.4)

Adoption of standards based on best practicable technologies is usually favoured by those sources which may find it more difficult to reduce their environmental disturbances to an acceptable level. They, prefer standards that require the use of certain devices, usually of the end-of-process type, which burdens everyone with the same increased cost.

Another problem arises when no agreement can be reached concerning the interpretation of 'best practicable technology'. According to Queensland Mines Limited (sub. 41, p.1), who mined the Nabarlek deposit, lack of agreement on the standards to be used between the Northern Land Council, the Office of the Supervising Scientist and the Northern Territory Department of Mines and Energy has meant that:

We cannot plan or engineer a proposal to deal with the problem [dispose of certain mine waters] until we know what environmental criteria will apply. The catchall guideline that all impacts must be 'as low as reasonably achievable' is insufficient where the parties to the decision cannot agree on the criteria for 'reasonable'.

Perhaps the major problem with technology based standards is that they are inherently arbitrary. The fact is that there is available now a technical solution that would reduce emissions from every mining activity to zero. Such a system involves simply banning all mining and mineral processing. However, most policy makers are aware of the large economic losses that this option may involve and they temper the determination of technological feasibility by economic considerations. But given that policy-makers are forced to employ economic criteria in setting technological standards anyway, it is better to explicitly employ an economic approach to standard determination. This approach automatically requires that technological feasibility be considered while explicitly providing a mechanism for assessing the value of the standards to society.

- Uniform standards

A fundamental problem associated with all standards is that unless site specific regulations are established, the outcome is likely to be economically inefficient. However, as the Trades and Labor Council of Western Australia indicated (sub. 39, p.27), such site specific standards are extremely difficult to accurately determine because they vary with site and project characteristics.

In contrast, uniform standards require mining operations to meet the same standards regardless of their specific local circumstances. Obviously the drawback is that these standards tend to take little consideration of differences in the relationship between environmental impacts and environmental quality or differences in the costs and benefits of complying with the standards, all of which are site-specific. The NSW Coal Association stated (sub. 45, p.10) that:

The major impediments to streamlined and efficient procedures lie within the provisions of the EPA Act, which specifies a rigid set of requirements to be followed, regardless of the nature, scale or location of individual mining proposal.

Economic efficiency requires that the standard be related to the social cost of environmental disturbance. There is no a priori reason to believe that such a cost is the same in all regions and, thus, no economic justification to call for uniform standards across all states or even within states. In this respect, the Department of Resources Development WA is in principle correct when arguing (sub. 48, p.15) that: "Environmental assessment and management is best carried out by State agencies which have expertise in the particular needs and problems of the individual State."

On the other hand, lower administrative and compliance costs may offset some of the efficiency cost associated with the application of uniform standards to different projects.

Prohibition

Prohibition is a special type of standard where the threshold is assumed to occur at a negligible level of environmental disturbance. Based on this, usually implicit, assumption, it has been argued that a total prohibition of activities requiring the use of the environment in some areas is the most efficient manner to ensure their preservation. For example, the Nature Conservation Council of NSW states (sub. 50, p.5) that:

Under no circumstances is exploration, mining or minerals processing to be permitted in National Parks, Nature Reserves, Marine Reserves, National Estate or areas classified under SEPP 14 (Coastal Wetlands), SEPP 19 (Urban Bushland) or SEPP 26 (Littoral Rainforest). Exploration, mining and mineral processing should not occur in areas that are under consideration or being nominated for classification as any of the above.

Prohibiting environmental disturbance by mining-related activities as a matter of principle without examining the special characteristics of each location cannot be justified on economic grounds. This does not mean that after considering the special characteristics of a location, outright prohibition may not be the best solution to environmental problems.

7B.3 Monitoring

Effective monitoring constitutes a major practical problem in all forms of government intervention. Standards are often advocated on the basis that their use facilitates monitoring which in turn facilitates compliance.

Regardless of the standards mechanism used, all systems must include safeguards against systematic evasion by requiring continuous or unpredictable periodic checking. Evidently, reliance on scheduled periodic inspections would inspire efforts to concentrate control actions in inspection periods.

A problem with monitoring under command and control approaches is who should perform it.

Monitoring by departments traditionally close to the mining industry and charged with royalty collection creates opportunities for conflicts of interest between maximizing royalty collections and monitoring environmental disturbances. For the second objective may require taking measures affecting the first. Attention to this potential problem is drawn by the Fraser Island Defenders Organization Ltd which pointed out (sub. 1, p.2) that:

... conditions of the lease are monitored by Mines Department officers who are not independent and are not impartial. They are generally hostile to conservationists and sympathetic to the mining companies. This organization has never been able to obtain the reports of any inspections carried out by these officers.

It is thus suggested that the monitoring work should be undertaken by an independent organization.

However, Gordon (1981) has pointed out that the incentives to falsify performance are somewhat greater under market-oriented systems. Under command-and-control systems the only benefit from deception is avoidance of some of the mandated control expenditures. Under a charge system, users can try to reduce both control expenditures and fee payments. However, effective devices to allow continuous monitoring may make this difference disappear.

7B.4 Innovation

Innovation is another important consideration in selecting a mechanism for government intervention. Section 8 argues that technological change plays a vital role in ensuring the sustainability of mining. Technological change has also an important role in ensuring an efficient use of the environment by providing novel means to limit or reduce the environmental impacts of mining. As stated by the Queensland government (sub. 55, p.29):

Many mining ventures in Australia face ... problems in terms of preventing land and water degradation during and after extraction and processing activities. Although there has been considerable development and application of stabilising and rehabilitation methods there are still problems requiring attention. Examples are stabilisation and rehabilitation of alluvial mining, watercourse stability and hydrologic modelling and risk assessment modelling.

These examples illustrate the continuing need for research and development in disciplines associated with the management of the land and water resources impacted by mining. Research should not only include engineering and hydrological aspects but physical properties such as air quality, water quality in terms of both point source pollution and diffuse source pollution as well as relevant ecological and conservation processes and attributes.

Rationing environmental services forces users to seek methods to reduce their use of those services. These methods often change with time as a result of users themselves searching for less costly methods of producing a salable output. In particular, a mining-related firm will find it desirable to adopt innovative techniques to reduce its usage of environmental services if the savings in the cost associated with the use of those services are greater than the costs of discovering and implementing the innovation.

The incentives for innovation are different under market-oriented and command-and-control systems. In principle, the savings from a given innovation and the incentive to innovate are greater under market-based systems than under the command and control methods.² In practice, under a

² In practice, this seems to be confirmed by evidence that the establishment of the Emissions Trading Program in the US has encouraged a modest degree of innovation in pollution control. See Tietenberg (1990).

command-and-control system, innovations to reduce the use of environmental services can lead to more stringent standards, thereby reducing the potential cost savings for the innovators. Tieterberg (1990) and Gordon (1981) have suggested that this may lead to the perverse result that users may have little incentive to innovate and good reasons to hide potential innovations from the control authority. Under these conditions, resistance may be the optimal strategy and firms will restrain their own research and development on means to minimize environmental disturbance to reinforce their claims that the regulations are unrealistic.

Novel technologies to reduce the use of environmental services may have the incidental result of conferring on their developers a competitive advantage. Those technologies can either be sold to other producers or may allow their developers to undertake projects where traditional approaches may lead to an unacceptable use of the environment. This, however, requires that the benefits of new technologies accrue to their developers. According to SX Holding Ltd (sub. 5, p.2), this may not be possible in certain cases because:

The environmental process forces disclosure of plans to competitors which can seriously disadvantage local companies. In addition significant process information is required to be disclosed either directly or indirectly in the environmental examination.

Due regard for the confidentiality requirements of companies when evaluating the environmental impact of a project is probably necessary.

7B.5 Conclusions

Market-oriented mechanisms are in principle more efficient than command-and-control systems. However, there is limited operational experience using market-oriented mechanisms in mining activities. This is particularly true of effluent charges and transferable permits. Moreover, the likelihood of errors and the administrative and monitoring costs associated with most market-oriented mechanism are probably higher than those associated with command-and-control systems. Thus, compromises are necessary between the economic efficiency of market-oriented mechanisms and the certainty and low administrative costs associated with command-and-control systems.

Thus, in practice a combination of market-oriented and command-and-control mechanisms to regulate the use of environmental services by mining activities may be often necessary. At specific locations, the best particular mix (if one is required) will depend on the particular interaction between a mining-related project and the environment.

Regardless of the specific form of government intervention adopted, monitoring is critical to ensure compliance. This is probably best done by an agency with no close links to the mining and mineral processing industry.

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7C VALUING THE ENVIRONMENT

The supply of and demand for environmental services are not conceptually different from those in respect of other goods and services. Underlying this proposition is the assumption that the value of environmental services can be somehow estimated and compared with that of other assets. That comparison is more readily carried out when environmental services are valued in monetary terms. This valuation can be extremely difficult given the lack of markets for many of the services involved but it is essential that it be undertaken so that informed decisions can be made on the basis of the overall costs and benefits of mining-related projects.

7C.1 The value of the environment

Establishing the money value of life and of such aesthetic consideration as beautiful views is extremely difficult. As arduous as it may be, however, the fact is that society implicitly establishes those values all the time. The difficulty is how to make explicit the valuation mechanism used in relation to environmental services. One way is to measure the value of the average loss of benefits of any environmental damage to reflect the opportunity cost of that damage. This has led to the development of valuation techniques such as contingent valuation, travel cost and hedonic methods (see boxes 7C.1, 7C.2 and 7C.3). Valuation techniques can be difficult to implement and their use may be controversial because of the need to take into account such elements as option values (see box 7C.4).

Little evidence was submitted to this inquiry on the use of those techniques. The Resource Assessment Commission is planning to undertake a contingent valuation project as part of its inquiry into options for the use of the Kakadu Conservation Zone. The Commission understands that such a project constitutes the first attempt to apply such a technique to mining-related projects in Australia.

7C.2 Uncertain costs and benefits

The physical effects of different forms of environmental disturbances and their interaction are only beginning to be understood. The social cost of these effects is still difficult to measure in money terms. Yet, in many cases it is necessary to know not only the effect of each disturbance on the total environment but also to determine the effects on separate groups. It has been suggested that this leads to the conclusion that the allocation mechanisms examined in Attachment 7B can not adequately ensure that the use of the environment will be held to the most efficient level.

Box 7C.1: Contingent valuation

The contingent valuation method (CVM) uses a direct approach - it basically asks people what they are willing to pay for a benefit, and/or what they are willing to receive by way of compensation to tolerate a cost. This process of 'asking' may be either through a direct questionnaire/survey or by experimental techniques in which subjects respond to various stimuli in 'laboratory' conditions. What is sought are the personal valuations of the respondent for increases or decreases in the quantity of some good, contingent upon an hypothetical market. Respondents say what they would be willing to pay or willing to accept if a market existed for the good in question. A contingent market is taken to include not just the good itself (an improved view, between water quality etc.), but also the institutional context in which it would be provided, and the way in which it would be financed.

One major attraction of CVM is that it should, technically, be applicable to all circumstances and thus has two important features:

- . it will frequently be the only technique of benefit estimation;
- . it should be applicable to most contexts of environmental policy.

Source: Pearce *et al* (1989), pp.69-70.

Box 7C.2: The property value (Hedonic) approach

The value of a piece of land is related to the stream of benefits to be derived from that land. Agricultural output and shelter are the most obvious of such benefits, but access to the workplace, to commercial amenities and to environmental facilities such as parks, and the environmental quality of the neighbourhood in which the land is located, are also important benefits which accrue to the person who has the right to use a particular piece of land. The property value approach to the measurement of benefit estimation is based on this simple underlying assumption. Given that different locations have varied environmental attributes, such variations will result in differences in property values. With the use of appropriate statistical techniques the hedonic approach attempts to (a) identify how much of a property differential is due to a particular environmental difference between properties and (b) infer how much people are willing to pay for an improvement in the environmental quality that they face and what the social value of the improvement is.

Source: Pearce *et al* (1989), pp.64-5.

Box 7C.3: The travel cost method

The services of, say, a recreation site on a fishing stream are usually provided at a low or zero price. However, every user pays a price measured by his travel cost. The user must reasonably find the 'commodity' at least worth the travel cost, while the opposite reasonably holds for the non-user. This insight ... [suggests] the travel cost method as a basis for valuing environmental services.

... Recent studies usually estimate travel cost demand models with multiple sites taking account of both site and individual characteristics in the estimation of the benefits associated with changes in site attributes. The method is also useful for the estimation of the benefits following the introduction of new recreation sites and for valuing quality changes.

... The travel cost method is based on people's actual behaviour and is hence less hypothetical than surveys where one creates a hypothetical market for the considered commodity. Nevertheless, the method has its own shortcomings. ... For example, people may attribute an existence value to a recreation area or a fishing stream even if they themselves never travel to the area or the stream in question. This value is not captured by the travel cost method. Thus, the method is quite problematic to use in many important applications in environmental economics.

Source: Johansson (1990), pp.44-6.

However, the exact measurement of costs and benefits is not necessary for policy making. In the case of such persistent pollutant as heavy metals (for example, lead and mercury), and radioactive materials, unchecked emission levels obviously exceed tolerable levels. The use of the allocation mechanisms discussed in Attachment 7B is advocated on an obvious conclusion that total costs of unchecked activities exceed benefits, not on an exact calculation that incremental (marginal) costs equal incremental benefits.

Given the uncertainty about costs and benefits, all systems to allocate environmental services are subject to uncertainty. In fact, the most compelling argument for such mechanisms as emission standards is based on the observation that only one error is involved in setting those standards, while two are involved in setting such mechanisms as effluent charges. Specifically, without adequate knowledge of the underlying supply and demand curves, the optimal level of environmental service is only an approximate estimate. With effective standards, once that estimate is obtained attainment of the optimal level involves only setting that level as a standard and enforcing it. If, however, a charging system is used, the effluent charge may be too high or too low to attain the standard. Thus, a system based on standards may set a wrong goal but will attain it. A charge system may either have a wrong goal or fail to attain the right one. The error in goal estimation is compounded by the error in charge setting.

Box 7C.4: User and intrinsic values

While the terminology is still not agreed, environmental economists have gone some considerable way towards a taxonomy of economic values as they relate to natural environments. Interestingly, this taxonomy embraces some of the concerns of the environmentalist. It begins by distinguishing user value from 'intrinsic' values. User values, or user benefits, derive from the actual use of the environment.

... Slightly more complex are values expressed through options to use the environment, that is, the value of the environment as a potential benefit as opposed to actual present use value. Economists refer to this as option value. It is essentially an expression of preference, a willingness to pay, for the preservation of an environment against some probability that the individual will make use of it at a later date.

... Intrinsic values present more problems. They suggest values which are in the real nature of the thing and unassociated with actual use, or even the option to use the thing. 'Intrinsic' value is a value that resides 'in' something ... but which is captured by people through their preferences in the form of non-use value. ... The briefest introspection will confirm that there are such values. A great many people value the remaining stocks of blue, humpback and fin whales. Very few of those people value them in order to maintain the option of seeing them for themselves. What they value is the existence of whales, a value unrelated to use, although, to be sure, the vehicle by which they secure the knowledge for that value to exist may well be a film or photograph or the recounted story.

Source: Pearce *et al* (1989) pp.60-1.

7C.3 The role of cost benefit analysis

Decisions must be taken one way or another. Decision-makers should, ideally, transform all values to a common unit to compare them. The economist's way of doing this transformation is by trying to express all values in monetary terms. This is the essence of a social Cost-Benefit Analysis (CBA) which looks at particular projects on a piecemeal basis and in each case seeks to resolve what should be done on the basis of the social net benefit.

The Scope of CBA

Some groups rejected the piecemeal approach to problems and called for a holistic solution. For example, the Nature Conservation Council of NSW suggested (sub. 50, p.7) that:

Included in the environmental impact assessment there should be a detailed assessment of the global environmental impacts of mining in addition to the localised impacts (in terms of both finite energy sources and atmospheric emissions).

DASETT (sub. 65, p.7) seemed to endorse a holistic approach also by proposing that:

Not only should the local area and all things within it be considered, greater emphasis must also be given to the combined effect of mining throughout the country/region/world. Environmental impacts of mining are not only localised in terms of the mining site. As providers of raw materials for downstream development the environmental consequences may be widespread.

A holistic approach is not objectionable in theory and is appropriate for the analysis of such potential global problems as the greenhouse effect. Nonetheless, serious doubts must be expressed on the worth of using a holistic approach to analyse the effect of most mining-related project. Such an approach is technically difficult (for both the natural and economic system are extremely complex), lengthy, and expensive. Thus, it is far from obvious that the use of a holistic approach to analyse the interrelation between each mining-related project and the environment would result in a net benefit to the community. Normally, the use of environmental services by mining involves routinely answering the question of whether the benefits derived from a specific mining project compensate for the losses in environmental services at a certain restricted location. Under those conditions, the traditional piecemeal approach of CBA is appropriate.

The importance of monetary values

The insistence on monetary valuation implied by CBA was also viewed with suspicion by some participants. The Nature Conservation Council of NSW, for example, believed (sub. 50, p.5) that:

While the mining industry argues that access to these lands [such as National Parks and Nature Reserves] is denied at a significant economic cost to the Australian community (AMIC 1986) they do not realise that the expenses incurred, and resultant losses, if access is permitted are incalculable. What is lost is most often partially unknown and irreplaceable and the damage irreparable.

To say that the cost of the services provided by the environment is incalculable and cannot be compared with the tangible monetary benefits derived from mining is tantamount to saying that this question cannot be answered. But if this is the case, it would be inconsistent to recommend preventing the use of environmental services by mining. For to suggest this is simply to say that the option of excluding mining has been in some way compared with that of permitting it and found to be preferable.

The fact remains that decisions must be taken and options compared one way or another. CBA provides a technique that makes that comparison explicit and uses an unambiguous criterion, notably the willingness to pay of individuals. In this regard, the ACF recommended (sub. 68, p.17) that "when the Commission addresses conflicts between mining and agriculture a comprehensive cost-benefit methodology will need to be adopted." The same technique seemed to be recommended (p.18) in other cases as well: "In providing a valid economic cost-benefit analysis the market for conserved biological heritage will have to be examined."

7C.4 Irreversibility

Accounting for the effects of irreversible changes in the natural environment resulting from mining activities was identified by several participants as a major consideration in estimating the social cost of mining. Those participants urged adopting courses of action which would preserve future options.

The intuitive basis for the concern with future options is related to the fact that the use of environmental resources may well have 'irreversible' effects. Determining the impact of these effects is complicated by the possibility that development per se may provide information about environmental problems. Johansson (1990) has argued that this raises the prospect of active learning, in the sense that environmental disturbances themselves may allow gaining information about the dynamics of the environment and how to ensure that disturbance costs are acceptable. Moreover, as Gordon (1981) has pointed out, irrevocable reallocations of scarce resources are made regardless of what action is taken concerning environmental disturbances. For example, a policy of reservation of mineral deposits may be counter-productive if as stated by the ACF (sub. 68, p.22): "Over the long-run the terms of trade for Australia's primary products have been moving unfavourably." In this case, waiting can only decrease, perhaps irreversibly, the value of our mineral deposits.

It seems reasonable to advocate a more conservative use of resources when irreversibility is a concern as suggested by the ACF which recommended (sub. 68, p.17) that:

... when comparing two alternative economic uses for national parks we should temper our judgment, particularly when the changes are irreversible, with the likely probability that our risk-adjusted discount rates are wrong. The principle should be err on the side of caution before assigning too much value to the benefits of mining.

The problem is to ensure that a recommendation for conservatism does not become a justification for arbitrary decisions.

Furthermore, if irreversibility in general is a concern, it seems paradoxical that measures are taken which may reduce the degree of reversibility. These measures appear to include making it extremely difficult in practice to revoke such decisions as banning exploration and mining in national parks. The Tasmanian Chamber of Mines (sub. 81, p.71) stated that:

Exploration and mining is already prohibited from more than 20 per cent of Tasmania which is under the classification of National Park or State Reserve. This means that in most cases, however valuable the resources may be which lie beneath the surface, our generation and all those who follow have been denied their benefit. There is no avenue, as there is in North America, for review in the light of future technology or future needs. We have, in substance, denied our children a voice in their own future.

In fact, provisions to revoke national parks exist. It is necessary, however, to ensure that the mechanism available to revise decisions concerning mining activities in those and other areas can be used effectively as major shifts occur in technology, economic conditions and community attitude toward the use of various natural assets.

7C.5 Lobbying

Edel (1973) has argued that mechanisms to regulate the use of environmental services are adopted when the groups benefiting from the adoption of those mechanisms are more powerful than those making unconstrained use of the environment. Those mechanisms are avoided when the first group is less powerful than the second. In neither case is there a guarantee that the political process yields an optimal amount of control. The following is a good example of this process during the gold rush in California:

The first prospecting companies could simply dump the gravel in the nearest river. Water would wash it downstream, leaving the miners room to dump more gravel. Downstream, these tailings might block the rivers, but, at first, nobody objected to the floods this caused because much of California was still uninhabited. Then, farmers moved into the central valley, took advantage of the fertility of the land and prospered. Eventually, they became more powerful than the gold miners in California legislature. Because floods were affecting their farms, they enacted a law to prohibit the dumping of mine tailing in streams. Gold mining was not banned. But the miners were prohibited from imposing external costs on the farmers. The high cost of disposing of the gravel by loading it into carts or trains made mining unprofitable. The gold rush was over. (Edel, 1973, p.107)

Several participants expressed persistent concerns that a similar situation exists today and that the environmental movement is an unrepresentative elite concerned more with protecting its own position than with the general welfare. The following is but one example of those concerns:

[The] deliberate process of politicisation, by community pressure groups acting on behalf of conservation interests, has distorted the process of logical public debate of development issues.

In many instances the public utterances of some 'Green' lobby groups, amount to misinformation campaigns, which by the use of scare tactics lead the community into a state of mind where the 'when in doubt do nothing' syndrome takes over. (AMEC, sub. 15, p.14)

On the other hand, lobbying efforts by the mining industry have been characterised by conservationists as 'confrontationalist' and 'propaganda'.¹

In the last instance, the main problem in allocating environmental services is that both costs and benefits can be identified with the activities of all groups making use of those services. No group with interest in the allocation of environmental services is in the position to claim that it alone represents the true interest of society at large. The government is faced with the difficult task of mediating between those strongly divergent interests. Furthermore, government itself has its own

¹ See submission by the Environment Centre of the NT (sub. 56, p.6) and the Nature Conservation Council of NSW (sub. 50, p.8).

particular goals and an organisation that may not be conducive to balance the pressures of various groups with disparate goals. The IAC (1989, p.51-2) found evidence which suggests that neither the government nor the private sector can be relied upon to achieve the appropriate level of development and proposed that an autonomous agency founded for the specific purposes of protecting environmentally sensitive areas be established.

7C.6 Conclusions

Valuing environmental services is necessary so that informed decision can be made on their allocation. Such valuation is difficult because of the lack of markets for many of those services, and the host of factors that need to be taken into account to obtain estimates by other means. Nevertheless, valuing the environment is essential because it plays a central role in cost benefit analyses which are the best available method to carry out explicit comparisons of the alternative uses of environmental services.

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8 MINING AND SUSTAINABLE DEVELOPMENT

Sustainable development has become something of a catchcry of the 1990s - a concept to be safely embraced by those holding potentially quite divergent views when it comes to particular environmental issues or problems and what to do about them. In other words, it is only when the debate progresses from the abstract to the concrete that such differences surface - often as quite irreconcilable stances (such as whether or not mining should be permitted in national parks under any circumstances). This section discusses what the concept of sustainable development might mean as applied to mining and mineral processing activities in Australia. Two viewpoints for analysis are identified. Under a broad criterion, sustainability becomes an economy-wide issue and a sectoral analysis of mining alone (or any other specific activity) becomes inappropriate. Under a narrow criterion, sustainability requires the rate of technological change in mining to at least counteract the depletion-inducing effects of mineral production. Yet, even under the later view, the more important issue in practice becomes the effect of mining and mineral processing activities on the natural environment, rather than the sustainability of mineral production.

8.1 Introduction

Numerous submissions to this inquiry have supported the concept of sustainable development.¹ Yet the concept remains fuzzy - seemingly capable of condoning all sorts of policies and actions (for a flavour of the variety of definitions of the concept currently on offer, see Box 8.1).

Thus, not surprisingly, there was little agreement on what sustainable development meant in practical terms. The evidence received by this inquiry clearly showed that, at least so far, the concept is far from operational and that there are no widely accepted interpretations. Unless a operational understanding of sustainable development is achieved and agreed to, the concept is unlikely to gain practical relevance and its potential to help elucidate environmental issues associated with mining (or indeed other economic activities) will vanish (see Box 8.2 for a rather jaundiced view on this aspect).

Based on evidence provided to this inquiry and on other information, analysis and expert opinion, this section attempts to refine the concept of sustainable development to a degree where practical policy recommendations can be made with respect to mining and mineral processing activities in Australia. The analysis makes a clear distinction at the outset between minerals as materials and minerals as resources. Also critical to the discussion is the distinction drawn between broad and narrow interpretations of what is meant by sustainable development. Such differing viewpoints are used to elaborate several issues of special importance to mining and mineral processing activities.

¹ Among those participants explicitly expressing support for the concept were: Australian Petroleum Exploration Association Ltd, Total Environment Centre Inc, Association of Mining and Exploration Companies Inc., United Mineworkers Federation of Australia, Tasmanian Chamber of Mines Ltd, and The Environment Centre N.T. Inc.

These include the relationship between sustainability and the theories of mineral exhaustion, empirical measures of mineral sustainability, the role of uncertainty, and appropriate spatial and time frames for analysis.

Box 8.1: What is 'sustainable development'?

Sustainable development (as opposed to growth) involves at least all the things that impact on individuals' wellbeing (or "utility"), and, more loosely, factors such as freedoms and self-respect.

Sustaining development in these broader terms involves providing a bequest to the next generation of an amount and quality of wealth which is at least equal to that inherited by the current generation. (Pearce et al, 1989, p.48)

... new paths of progress which meet the needs and aspirations of the present generation without compromising the ability of future generations to meet their own needs (The World Commission on Environment and Development).

Sustainable development requires that resources are not exploited in a manner which ignores the requirements of the community - either today or into the future (equity). Sustainable development means that economic growth must occur in a way which complements and enhances the natural environment (efficiency). Sustainable development demands a more detailed examination of the costs and benefits which arise through the exploitation of our natural resources (research). Sustainable development necessitates a more inclusive policy framework for the use of both renewable and non-renewable resources (policy processes). (Ministers Kerin and Cook, quoted in the Australian Financial Review, 13/2/90, p.36)

In the context of the Brundtland Commission report, sustainable development means initiating avenues of development which meet the needs and aspirations of the present generation without compromising those of future generations. ... the new avenues ... signal a need to reach an accommodation on development and environmental concerns by ways of rational consultation and recourse to scientific research and economic surveys. Specifically, this requires an appropriate mechanism to enable competing claims to be aired and the economic implications of any decisions to be recognised. Relatedly, the principle of sustainable development also implies a recognition of the principle of multiple or shared land use, as canvassed originally in the national conservation strategy. (Opposition spokesman Blunt, quoted in the Australian Financial Review, 13/2/90, p.36.)

This section reflects the state of thinking on the subject at the time of writing. Whether views on sustainable development presented here will become generally accepted only time will tell. For sustainable development encompasses a myriad of specialised and unresolved problems disguised under seemingly familiar terms.

Box 8.2: Sustainable development: A meaningless catchcry?

Sustainability appears to be accepted as the mediating term designed to bridge the gulf between 'developers' and 'environmentalists'. Its beguiling simplicity and apparently self-evident meaning have obscured its inherent ambiguity. Its survival attests to the fact that developmental interests now recognise that much more serious attention must be paid to incorporating a thorough understanding of environmental processes into project investment calculus, if for no other reason that failure to do so may result in economic losses. But the perseverance of the concept goes far beyond that. Developers now realise that under the guise of sustainability almost any environmentally sensitive programme can be justified. They thereby seek to exploit the very ambiguities that give sustainability its staying power. Similarly, environmentalists abuse sustainability by demanding safeguards and compensatory investments that are not always economically efficient or socially just. It may only be a matter of time before the metaphor of sustainability becomes so abused as to be meaningless, certainly as a device to straddle the ideological conflicts that pervade contemporary environmentalism. Once the notions that underlie sustainability are politicised, the concept is effectively devalued. (O'Riordan, T. in Turner, R.K. 1988b, p.29)

8.2 Minerals as materials and as resources

Mineral materials have played a crucial role in the development of human society. Entire historical periods are named after the material that was at the core of the technology associated with a particular age: stone, copper, bronze, iron. This has led to a widespread belief that the mineral resources available at any given time determine to a large extent the technological characteristics of an age. However, the causality usually flows the other way, that is, the state of technology at a particular period determines which minerals become economical.

As technological breakthroughs are made previously largely unused minerals become available to improve the material well being of society. When that occurs, mineral materials become mineral *resources*. According to Myers and Barnett (1985, p.3):

... at any time, available resources depend upon available technology. No mineral or other raw material is a resource unless the technology has been developed to utilise it.

Examples abound of known mineral deposits that remained unexploited until technological development made them economic. In Australia, readily accessible ore deposits went practically unused for thousands of years because Aborigines did not have the technology to extract and employ metals. A more recent example of the resource-creating effect of technological development is provided by gold mining in this country. According to Champion de Crespigny (1990, p.20):

The bulk of the [gold] production increases in the 1980s came from the 'rediscovery' of resources in old mining centres that had, because of the advances in technology, become economic.

Thus, two elements are needed to create mineral resources: (human) technology and (natural) materials. In De Gregori's opinion (1987, p.1242), the former is more important than the latter:

[The] creative process of fashioning the material and non-material stuff of our environment in a form usable and serviceable to human beings is determined by science and technology. It is the sum total of human knowledge and capability that is the prime resource and the one that defines all others.

The preceding discussion also implies that the mere existence of known deposits of mineral materials does not necessarily result in mineral production. In fact, the know-how of the mining industry is essential to transform those deposits into economic mineral resources worth of being exploited. Moreover, if technology is essential to create economic mineral resources, such resources are not 'natural' but the product of human endeavours. Aluminium is a prime example. Elemental aluminium does not exist in nature. It was derived from aluminium oxide only in 1825 after electric power had become available. Without that technological breakthrough, Australia's large bauxite deposits would probably be as worthless to us as they were to the Aborigines for thousands of years.

8.3 The need for change

The notion of nature and society as dynamic and ever changing systems is relatively modern. Malthus' *Essay on Population* (1798) was one of the first works to formalise this view. He proposed that societal change was characterized by unrelenting growth which would only be checked by constraints in the availability of natural resources. According to Malthus, there was a constant tendency for all forms of life to multiply beyond the capability of available nourishment to sustain them.

Malthus' view was probably not particularly pessimistic at a stage of human development when pandemics regularly decimated entire communities. Such views reflected a society unaware that advances in science and technology were about to dramatically multiply human productivity. Ever since, neglect of the crucial role played by technology has become a frequent fault of attempts to extrapolate the likely implications of change on society. This has particularly affected the interpretation of the likely consequences of potentially finite mineral resources.

Malthus' work, and that of his successors, did make a major contribution to the analysis of change in society by focusing attention on the potentially disastrous effects of some forms of change. This is important because, while change is continuous and unavoidable, there is nothing in the natural system, nor in the human-made one, to ensure that change leads to outcomes compatible with long term human survival. As the need to consciously ensure survival becomes increasingly accepted, the emphasis is shifting away from traditionally defined economic growth to a broader concept of change which embraces more than use values or narrowly defined consumption possibilities. (See attachment 7C for a discussion of non-use values and other issues associated with valuing the environment.)

The planning horizon is also expanding to encompass not only the maximisation of short-run consumption but also longer-term considerations. In particular, the issue of whether current levels of consumption can be maintained without permanently impairing longer-run consumption opportunities is being increasingly debated. These concerns have led to the concept of 'sustainable development'.

8.4 Sustainable development: Two views

Two views of sustainable development can currently be identified. A broad criterion has been implicitly used by economists for a long time and underlies much of the rules for resource allocation discussed in section 7. On the other hand, a much narrower view which is currently gaining support requires a paradigm shift that has the potential to affect the way resources are allocated. The two criteria are examined next.

The broad criterion

There has always been a trade-off between providing for current and future consumption (in the form of current investment). The choice was very obvious, limited and relatively simple as long as technology allowed providing only for the basic ongoing needs - food, clothing and shelter - of the population. As productivity has increased and surpluses mounted, however, society has increasingly had to face a choice between present and future consumption of a great variety of goods and services. Economists have tried to describe the way this choice is made by developing models that incorporate such concepts as income, savings and investment. Some have gone beyond the realm of positive science to propose how the choice between present and future consumption ought to be made. They argue that this choice must be constrained, on ethical grounds, by the proviso that future consumption be at least equal to present consumption. This idea can be traced at least back to Hicks' concept of income, who suggested (1939, p.172) that:

The purpose of income calculations in practical affairs is to give people an indication of the amount which they can consume without impoverishing themselves. Following out this idea, it would seem that we ought to define a man's income as the maximum value which he can consume during a week, and still expect to be as well off at the end of the week as he was at the beginning.

The notion of broad sustainable development can be derived from Hicks concept of income by replacing 'society' for 'man' and 'any arbitrary period' for 'week' in the above quotation. It corresponds to the definition of sustainable development used in the Brundtland report (WCED 1987) and in Pearce *et al* (1989). (See Box 8.1)

The broad interpretation of sustainable development does not impose or assume any a priori restrictions on how society attempts to ensure that future generations meet their own needs. This criterion is perfectly consistent with the traditional economic interpretation of production - where substitutability among factors in production and goods and services in consumption is restricted only by available technologies. This broad concept of sustainability, then, takes an economy-wide perspective - making no provision for the special treatment of any particular sector of the economy, such as mining and mineral processing. In particular, broad sustainability imposes no artificial constraints on substitution possibilities between natural resources and other forms of (man-made) capital.

The broad sustainability criterion is rejected by some groups, including the Australian Conservation Foundation (ACF) which argues (sub. 68, p.3) that:

This broader approach is generally unacceptable since it implies perfect substitutability between environmental capital and human-made capital.

The problem with this argument is that the degree of substitutability between natural and man-made capital is an empirical question which cannot be answered in general. In some cases, substitutability is technically and economically possible (for example, synthetic for natural fibres in apparels); in others, it may be impossible (for example, replacing the *ozone layer*). The broad sustainability criterion does not attempt, or require, elucidating the general degree of substitutability between natural and human-made capital. It does assume that when substitution between those two forms of capital is both technically and economically feasible, such substitution can take place - provided the ability of future generations to meet their own needs is preserved.

Narrow criterion

Modern science has provided numerous insights into the extraordinary complexity of ecosystems but not a thorough understanding of how human activities affect such systems. As a result, an increasing number of specialists are calling for an extensive 'uncoupling' of natural and the man-made systems as the only means of ensuring that human-induced change does not impair the environment's capacity to sustain life. This has led to a narrower definition of sustainable development which, according to Turner (1988a, p.352), should:

maximise the net benefits of economic development, subject to maintaining the services and quality of natural resources over time.

This idea was subsequently elaborated by Turner (1988b, p.30) in the following terms:

Sustainability ... [embraces] ethical norms pertaining to the survival of living matter, to the rights of future generations and to institutions responsible for ensuring that such rights are fully taken into account in policies and actions.

Turner's notion of what is meant by sustainable development is representative of the views espoused by a growing number of groups which made submissions to this inquiry, including the ACF. The ACF defined (sub. 68, p.3) sustainable development as:

the passing of the natural environment from one generation to the next in a condition relatively unaffected by human activity such that the ability of future generations to provide for their own needs is not compromised by the present generation.

adding that:

Ecological sustainability implies that 'future generations must not inherit less environmental capital than the current generation inherited'.

This view introduces a new caveat to the broad definition of sustainable development, namely, the requirement that the quality of natural resources - and in particular that of living matter - be maintained.

This narrow sustainability criterion implies a paradigm shift from that underlying the broad interpretation of sustainable development. Under the narrow view, nature cannot be considered as a source of natural capital to be transformed by human technology into useful goods and services subject only to the requirement that future generations should have access to an equivalent, but not necessarily the same, total amount of natural and man-made capital. Narrow sustainability accords ecosystems their own rights, especially that of survival, altogether independently of human desires. In other words, this criterion requires that nature be preserved not on the basis of its current or future value to humans but as an independent ethical obligation.

It is also possible to argue for the maintenance of ecological functions on the basis that the environment provides useful services and production factors to society - as economists sometimes do. This utilitarian interpretation of the narrow concept of sustainable development does not imply a paradigm shift from that underlying the broad sustainability criterion and may lead to the same policy prescriptions as the narrow interpretation based on ethical considerations. In some cases, however, there may be significant difference between the two interpretations. This is especially likely when inter-generational considerations are critical and may be also the case when non-use values are important.

Note that both the narrow and broad criteria of sustainability - like concepts such as profit maximization and economic efficiency - are normative precepts. They indicate what society ought to strive to achieve and may not be descriptions of how society actually behaves.

8.5 Minerals and sustainability: Broad criterion

This section relates the broad view of sustainability to the interpretation of minerals presented in section 8.2 and attempts to reach some operational rules.

The broad sustainability criterion requires that the needs of the present do not compromise the ability of future generations to provide for their own needs. Under this criterion, the disappearance of a particular mineral material need not have adverse effects, as long as substitutes exist. After all the bronze age - the first period in which metal alloys were used - took place despite the earlier exhaustion of native copper deposits. And the exhaustion of meteoric iron - the only source of raw material for the earliest iron objects - did not preclude the later emergence of an iron age. The gold rush in New South Wales and Victoria last century exhausted most of the deposits of alluvial gold in those states and precluded their use by the present generation. Yet few would argue that the net effect on Australian society of that gold rush was negative despite the fact that such exploitative phenomena are by definition transitory.

The role of technology

Determining the broad sustainability of minerals requires analysing the effect of technological progress on the supply and demand of minerals (see Attachment 8A). A major problem on the demand side is that technological progress may have direct and indirect substitution effects that

interact with each other in quite complicated ways. Some forms of substitution are quite direct, involving mostly material for material substitution: the substitution of aluminium for glass in soft drink containers, aluminium for copper in electric cables, or plastic for magnesium in motor vehicle parts are examples. Other forms of substitution are more subtle, such as permitting something to be made with less material: use of thinner body panels in automobiles or use of higher voltages which decreases the amount of metal required to transmit a given amount of electric energy being examples. Other forms of substitution eliminate the function of a material altogether: for example, the substitution of satellite communications for use of copper cable for transmission purposes.

The effect of technological progress on the supply side is as difficult to predict as on the demand side. This is typified by the following description of the development by Charles Potter (a Melbourne brewer and inventor) of the flotation method to recover metals. According to Raymond (1986, p.235), late last century Potter had observed that:

... the bubbles rising in fermentating beer carried impurities to the surface. In this he was to glimpse the yeast of a new technology in mining. It was a likely accident to happen in Australia, where beer-drinking and mining had become inseparable cultures.

After a decade's work, Potter developed a process for recovering metals by flotation, ... , and he patented it in 1901. It was tried out by one company in Broken Hill with great success. ... Once the idea of flotation got about, variations were rapidly tried out, for vast sums were at stake. BHP, the mining giant, had tailing dumps containing metals worth more than twenty million dollars waiting for just such a method of treatment.

It is highly improbable that anyone, even an Australian, could have foreseen that activities in the brewing industry would lead to a technological change that would affect mining world-wide. And few people could have predicted that basic research into electromagnetism and radioactivity would someday lead to the widespread use of aluminium and uranium.

The broad sustainability criterion does not require that technological change compensates for the depletion-inducing effects of mineral production so as to prevent increases in real mineral prices. Under the broad criterion, increasing mineral scarcity (and prices) may not impose an insurmountable constraint on the economy if mineral depletion is compensated by other developments. For example, given its relative scarcity and high prices, malachite is nowadays used almost exclusively for ornamental purposes. Yet malachite is a mineral rich in copper and almost certainly was the first ore widely smelted to produce metallic copper. The fact that malachite could not provide for a sustainable copper mining sector did not preclude the growth of copper mining based on entirely different ores. Nor would the passing of copper as an industrial material preclude the possibility of the continued existence of a healthy mining industry based on other minerals.

Depletion-offsetting developments may take the form of increases in other forms of capital assets (and this underlies the argument for undertaking 'compensatory' projects) as well as technological progress. However, determining whether mineral depletion is being compensated by those

developments is extremely difficult because of our limited understanding of the dynamics of technological progress, its economy-wide effects and the complex interaction between technology and the supply and demand of minerals and other production factors.

The role of markets

In view of the discussion above, the broad sustainability of mining activities can be best secured by ensuring that those activities take place in an efficient economic setting of complete competitive markets. In other words, the broad mineral sustainability is best secured by ensuring that markets exists for all commodities produced and consumed in current and future periods by the mining and mineral processing industry.

The above requires, among other things, that inputs to mining activities (including environmental services, see section 7) be properly priced to reflect their full social cost and that commodity markets be competitive. It also requires that property rights to minerals to be well-defined so that mining firms have incentives to choose intertemporally efficient production rates. Moreover, it also requires well functioning financial markets (because most mining-related projects are capital intensive and long-lived) and efficient educational and research institutions (because of the central role played by technology in the mining industry).

An important caveat to the use of markets to ensure mineral sustainability relates to the requirement that the ability of future generations to meet their own needs be preserved. No guarantee can be given that such requirement will be satisfied under a market or any other system of resource allocation. Markets help achieve that requirement by allocating available resources in the best possible way but whether or not there will always be enough resources to allow future generation to meet their own needs is an empirical question with no apparent answer.

8.6 Minerals and sustainability: narrow criterion

The narrow sustainability criterion requires maintaining the services and quality of natural resources over time. A literal application of the narrow sustainability criterion to minerals leads to absurd conclusions.

In a strict sense, preserving the services and quality of mineral materials requires forgoing their use altogether - an obviously impossible condition which would, in practice, threaten the survival of our society. As pointed out by AMEC (sub. 15, p.16):

... without Mining, modern day society as we know it would cease to exist. The use of minerals for medicinal, manufacturing, power generation, building and construction, transport and similar purposes, are essential to the 'standard of living' and indeed, the 'quality of life' of all Australians.

Under the broad interpretation of sustainability, reductions in the amount of mineral resources are acceptable as long as they are compensated by developments in other economic sectors. The narrow sustainability criterion requires that no decrease takes place in the amount of mineral resources regardless of any potentially offsetting changes that may occur in other activities.

The narrow sustainability criterion cannot logically be used in relation to mineral materials but it can be readily applied to mineral resources. Maintaining the quality and services of mineral resources in the long run may be possible because such resources are not a fixed stock but continuously redefined by technological change. As such, operational rules for sustainable development can be defined. The Australian Mining Industry Council (AMIC) points out (sub. 29, p.7) that:

Sustainable development in minerals suggest that the rate of use should not exceed the capacity of society to find new sources, acceptable substitutes or to recycle existing resources.

More generally, Zarsky (1990, p.5) has suggested that:

... exhaustible resources such as minerals and fossil fuels should be mined at an optimally efficient rate, that is, a rate equal to the rate of technological and renewable substitution.

The rules suggested by AMIC and Zarsky (1990) provide useful insights by emphasising the central role of technological change in the analysis of what might constitute sustainable development. Those rules implicitly recognize that the optimality of a particular mining rate depends on available technology. They also imply that technological progress in the mining industry must be maintained to ensure sustainability, because without such progress mineral resources would become true stocks and sustainability would not be achievable.

Applying the narrow concept of sustainability requires measuring the rate of technological progress and defining appropriate mineral classes; defined, in part, by that progress and the substitution possibilities such progress permits. Such requirements present formidable operational problems. Accounting for the rate of technological progress and the substitution possibilities it makes available is extremely difficult. This is true despite the fact that the narrow criterion only requires considering the mining and minerals processing sector in isolation, and not the economy-wide technological progress required by sustainability in its broad form.

Defining mineral classes to which the narrow criterion should apply is also difficult. The problem is determining whether sustainability should apply at an aggregate of all minerals, which would need to be defined, or to particular mineral classes. The latter would in turn require specifying the extent of those classes. For example, in an increasingly broader order a class could include all copper-bearing minerals, all non-ferrous minerals or all metallic minerals. Given the scope for substitution between related minerals - for example, much of the demand for aluminium and practically all the demand for copper are based on the ease with which these metals transmit electricity and heat - it would seem preferable to define broad rather than narrow classes.

Narrow sustainability and theories of mineral exhaustion

The view of minerals as a finite stock of materials underlies much of the debate about their scarcity. That view has also played an important role in interpretations of the sustainability of minerals consumption. The remainder of this section examines the relationship between mineral exhaustion and narrow mineral sustainability and some of the issues arising from it (see also Attachment 8A). The analysis applies only to the narrow criterion because only under this criterion it is valid to examine mineral-specific conditions and derive operational rules for the mining industry in isolation from other economic sectors.

The theory of optimal depletion requires that profit-maximising firms with exhaustible assets produce at rates less than those at which current operating profits would be maximised, thus reserving supplies for later production when they are expected to yield higher profits than in the present as a result of continuously increasing real mineral prices. The theory's requirement of reduced current production would suggest a close relationship between this theory and the concept of sustainability. However, the link is superficial because (narrow) sustainability is about preventing the exhaustion of resources while the theory of exhaustion is concerned about maximizing profits given that resource exhaustion will occur. According to Gordon (1967):

The automatic assumption that the pure theory of exhaustion is applicable to natural resource commodities involves a complete misunderstanding. Exhaustion is not necessarily desirable. Just as machines can become obsolete before they wear out, extraction of minerals can become unnecessary before the supply is depleted. Scrap availability might make mining undesirable; solar energy might displace mineral fuels. The pure theory only provides a test of whether exhaustion is profitable. If it were, the theory indicates that we would observe firms sacrificing current profits [including mineral rents] to increase future supplies. Since mineral industries generally do maximize current profits, exhaustion of minerals is unlikely. Thus, instead of providing rules of conservation policy, the theory suggests that conservationists are concerned about a non-existent problem.

The theory of exhaustion is more than a mere academic artifact only under the assumption that technological progress cannot indefinitely replace mineral materials depleted by production. One way technological progress counteracts production is through exploration. In this regard, the Normandy Poseidon Group argued (sub. 11, p.12) that one aspect of sustainable development of particular relevance in the context of mining is that:

... the stock of mineral resources being depleted by current mining must be replaced by newly discovered economic resources. Thus continuing exploration is necessary for sustainable development.

The theory of exhaustion implicitly assumes that the substitution possibilities in production and use are strictly limited. If this were not the case, any significant price increase would trigger substitution effects that would pre-empt the increasing price path predicted by the theory of exhaustion.

Measuring exhaustion

Estimating directly the rate of technological progress to compare it with production rates and thus obtain a measure of mineral sustainability involves numerous practical difficulties. Instead, it is preferable to use the real price of minerals (further evidence on which is contained in Attachment 8A). This approach does not obviate the problem of identifying appropriate mineral classes but is much simpler than trying to directly measure the extent to which technological progress counteracts depletion-inducing mineral consumption.

The evidence in Attachment 8A strongly suggests that technological change has so far more than offset depletion-inducing consumption. This has produced a trend towards lower real mineral prices over the long run. In other words, mineral consumption has been sustainable despite the fact that the materials used in the production of those resources have become less accessible.

B

Numerous regions that were once world-class producers of various minerals are no longer major mining centres. Spain was once the world's pre-eminent mining centre for gold, silver and copper; Wales of copper; England of coal and iron ore; France of bauxite; Germany of silver, lead and tin; and the Great Lakes region of North America of copper and iron ore. Nowadays, mining has ceased to exist altogether in some of those areas. In the rest, mining now pales into insignificance compared with today's leading mining centres.

Ahmad *et al* (1989, p.3) have pointed out that:

If a country is exhausting its renewable or non-renewable resources, its current income will thus be inflated by the sale of natural assets that will eventually disappear. ...

Underlying this ... is the implicit, as well as inappropriate, assumption that natural resources are so abundant that they are costless or have no marginal value. Historically they have been regarded as free gifts of nature - a bias that provides false signals for policy makers.

They proposed a solution involving splitting net revenue from the production of minerals into user costs and income. According to Ahmad *et al* (1989, p.4), this can be done by using two factors: a discount rate and

the number of periods, n , over which the resource is being liquidated. This can simply be read from the ratio between total reserves and whatever amount is extracted in the current period.

The same distinction between income and user costs is proposed in Mikesell (1989) who uses a similar approach - one based on the discount rate and the number of years to exhaustion of mineral reserves² - to separate user cost from income.

The methodology proposed both in Ahmad *et al* (1989) and in Mikesell (1989) relies on the assumption that mineral reserves are a correct measure of the ultimate amount of mineral materials to be extracted. Only under this assumption it is possible to estimate the number of periods 'over which the resource is being liquidated' and to split user costs and income. But reserves are an inadequate measure of future mineral availability and any methodology that relies on reserves as indicators of that availability is bound to produce questionable results. As stated by Rees (1985, p.19):

When proven reserves - however determined - are used to forecast resource life, the implicit assumption is made that there will be no new discoveries, no technological change, no revision of production objectives and no price changes. Reserves are only proved after considerable sums of money have been spent on surveys and test borings. Mining companies, whether private or government owned, are unlikely to invest heavily in exploration when they hold enough reserves to meet projected demands for the next twenty to thirty years. Thus, for most minerals, proven reserves simply reflect current consumption levels and the search policies of the companies and say little about the potential size of the total resource stock.

The problem with using the user cost-income splitting methodology mentioned above can be illustrated by noting that in 1960 Australia's reserves of copper were about 1 million metric tons.³ That year's production was about 111 thousand metric tons which meant that this country could not have sustained copper production for more than 10 years. Yet, Australia's reserves had increased to 9 million metric tons in 1975. During that period, Australia's copper production more than doubled to 227 thousand metric tons.

The splitting methodology mentioned above would have suggested in 1960 that a large proportion of net receipts from copper mining in this country were not true income. Furthermore, those receipts were supposedly bound to be short-lived. But the fact is that this country managed not only to sustain but to increase that income while simultaneously enlarging the size of its mineral 'capital'. This phenomenon is not confined to copper. AMIC has pointed out (sub. 95, Attach. 5, p.5-6) that:

In 1980, the Bureau of Mineral Resources estimated Australian economic demonstrated resources of gold at 332 tonnes. In the following eight years Australia produced 529 tonnes, almost 200 tonnes more than the 1980 estimate of what was available. The economic demonstrated resources in 1988 was at 1378 tonnes, almost a factor of 5 in total over the 1980 figure. ... In most cases, the additional resources came about from a rapid increase in exploration expenditure due to the increase in the price of gold and also from the availability of new processing technology which ensured a lower cost of production from previously uneconomic resources.

² Mineral reserves are defined as the amount of material already discovered and known to be economically extractable under current price and technological conditions (proved reserves) or known but not economic to work under current prices and technological conditions (conditional reserves). The discussion in this section applies equally well to both interpretations of reserves.

³ The statistics quoted in this paragraph from Tilton (1977, p.44).

The phenomenon is not unique to Australia either. The statistics in Table 8.1 show that a similar process took place at a global level.

Table 8.1: Growth of World Reserves

	<i>Copper</i>	<i>Lead</i>	<i>Zinc</i>	<i>Bauxite</i>
1940s	91	30-45	54-70	1 605
1950s	124	45-54	77-86	3 224
1960s	280	86	106	11 600
Reserves:				
% growth rate/yr				
1950s-1970s	7.25	5.0-5.7	4.7-5.2	9.75
Production:				
% growth rate/yr				
1950s-1970s	3.75	1.75	2.75	7.0

Note: Reserves in millions of tonnes near end of decade indicated (gross weight for Bauxite).

Source: Crowson, P.C.F. (1982) 'Investment and Future Mineral Production', *Resources Policy*, Vol. 8, No. 1, pp. 3-12.

Table 8.1 clearly shows that, for the major minerals included, significant growth in production has not led to reduced mineral reserves. Instead those reserves have increased. In other words, the world has managed to increase consumption and the amount of minerals, a physical impossibility if reserves were an adequate measure of the mineral 'stock' available for consumption.

There is thus clearly a divergence between the model underlying the user cost-income splitting methodology and available empirical evidence. This divergence is explained by the fact that mineral reserves do not take proper account of technological progress. As stated by Vogely (1984, p.600):

Almost all studies dealing with the future mineral supplies are based upon the physical view of exhaustion. Most pay lip service to the technology and exploration, but nevertheless estimate a stock of 'potential reserves,' thus placing a finite limit on ultimate production. Because considering supply as use of a stock misstates the nature of the supply process, such efforts add no information about future supplies. Not only are they useless, but if believed by policy makers, they can lead to very bad policy of the self-fulfilling variety.

It seems laudable to try to determine the 'true' income component of net mineral revenues. Such efforts, however, will produce deceptive results unless technology is also properly accounted for. How this can be done in practice is not clear. Until this problem is solved, attempts to split income from user cost in mining can only be misleading.

8.7 Mining and the sustainability of the biosphere

Section 7 discussed the many environmental disturbances that mining can cause and pointed out that some disturbance is usually unavoidable. This creates a potential problem from the point of view of sustainability because, while a particular mining strategy may be compatible with the sustainability of mineral resources per se, the effect of such mining on the environment may lead to an unsustainable general outcome.

When sustainability is defined in its narrow sense, changes in the biosphere may never be entirely offset by changes in other forms of capital. For example, the Australian copper industry has been able to increase its production while avoiding significant cost increases or reserves reductions. Thus, copper mining in this country can be said to have been compatible with both the broad and narrow sustainability concept as far as the sustainability of copper mining itself is concerned. However, copper mining and processing has not always been compatible with the sustainability of ecosystems affected by such operations. The Queenstown (Tasmania) experience demonstrates this.

Yet not all major changes in the environment resulting from mining-related operations are necessarily incompatible with the sustainability of the biosphere. The Weald of Kent in England provides an example of this. According to Raymond (1986, p.149):

The Weald today is a broad expanse of gently rolling hills and vales, a patchwork of fields and hedgerows, with scattered woods and copses. ... The low profile of the Weald has a timeless, unchanging look. But this is deceptive. The landscape today is not the original countenance of this part of southern England.

Once, the Weald was densely forested with mature oaks, beech and chestnut. But the forests of the Weald stood on chalk, and in the chalk, beginning in Roman times, rich pockets of iron ore were found. ... To smelt and forge the iron, however, the ironmasters needed charcoal - and so began the clearance of the forests.

From the point of view of iron mining and processing per se, the decimation of the Weald of Kent may have been compatible with sustainability.⁴ The same may also be said about the environment in general. After all, most of the cleared fields in that area have been under pasture and highly productive for centuries. Others grow hops for which Kent is now famous. And the use of charcoal - by providing a cheap source of energy and reducing agents - did accord a significant initial advantage to the English iron industry establishing the foundations for the industrial revolution that would eventually make England a world power.

However, the fact remains that the environmental impacts of mining have the potential to introduce a wedge between the sustainability of mining and that of the biosphere. As pointed out by the AMIC (sub. 29, p.42):

⁴ This would have been the case if a back-stop technology to provide alternative sources of energy and reducing material had existed, or been under development, at that time. As discussed later in this section, this does not seem to have occurred.

While most assessments of minerals have focussed on supply as the limit to our use of mineral resources, the restriction on our future use of mineral resources is more likely to be the impacts of their extraction and disposal on other resources.

Thus, it is imperative to ensure that the mining and mineral processing industry (and all other users of the environment) are made fully accountable for the environmental impacts associated with their activities. There is some evidence that this is currently occurring. For example, Myers and Barnett (1985) suggest that there is evidence of increasing mineral prices since the 1970s which may be the result of accounting for environmental cost. Complying with tighter environmental requirements to account for environmental costs can be expected to increase production costs, reduce mineral availability, and increase prices. This is in no way an artificially induced scarcity. Nor should increased mineral prices be considered an undesirable effect of accounting for environmental costs. On the contrary, an increase in mineral prices may well be the most efficient outcome.

The full implications for sustainability of increasing mineral prices are not likely to become evident in the immediate future because the process of accounting for environmental costs will undoubtedly continue. This will tend to increase production costs and mineral prices. The critical issue is what will occur after that process is complete. One possibility is that mineral prices continue to rise. Or prices may stabilize or even fall in real terms as occurred between 1870 and 1970 (see Myers and Barnett, 1985). If prices continue increasing, society would have a clear indication of failing mineral sustainability. If they stabilize or fall, society will know that another period of mineral sustainability has been reached. In this case, the short-run traumas of higher mineral prices and decreased mineral availability would have proved to be the penalty for achieving longer-run sustainability.

8.8 Other considerations

There are a number of other issues that bear on the concept of sustainability and that have the potential to have significant effects on the way mining activities are conducted. They include uncertainty, the role of planning and the proper spatial and temporal framework to be used in analysing sustainability. Those issues are examined in this section.

Uncertainty

In practice, sustainability cannot be achieved without continuous change to adapt to ever-evolving social and natural conditions. Any change involves the possibility that actual outcomes may be different from the results originally expected. Mineral production in particular takes place in a variable environment where uncertain geology and mineral markets mean that the results of any project can never be perfectly anticipated.

Technological progress introduces an additional and potent source of uncertainty. New mining techniques, transportation methods and production processes are constantly being tried in order to access and process increasingly more difficult ores, without incurring higher costs. New applications are constantly being developed involving substitution of some materials for others. In some cases, even new mineral resources are being created.

While innovation has the potential to make society better off, some experimentation can lead to disastrous consequences. For example, the conditions under which radioactive minerals were handled by two generations of Curies, Marie and Irene, helped not only launch the atomic age but also led to their premature death. Many other people succumbed later as a result of society's ignorance of the real effect of radioactivity on living organisms. Even today, there is disagreement about the risks of nuclear energy both among specialists and the public in general. Some societies have decided that the expected benefits of nuclear energy outweigh its potential costs and have embarked in ambitious programs to develop this energy source. France is an example. Other nations, such as the US, have decided that the expected net benefits are not large enough to warrant the risks and have all but halted their nuclear programs and continue to rely mostly on coal-fired power plants. Australia has adopted a similar stance and rejected nuclear in favour of coal-fired plants.

It is possible that both the nuclear and coal paths may be compatible with general sustainable development. The nuclear option can provide vast amounts of energy with potentially minimum air and water pollution. Yet Chernobyl clearly pointed out to some of the dangers involved. Further, no proved technology has been developed yet to satisfactorily disposed of the by-products of nuclear power generation. Ultimately coal may provide a more acceptable source of energy than uranium. But then again, carbon dioxide, sulphur dioxide and other noxious emission associated with coal burning are an ongoing source of air pollution that may be associated with global problems such as acid rain and the greenhouse effect.

Given the risks posed by both nuclear and fossil fuels, it may be argued that sustainable development may in fact require using such alternative energy sources as solar or wind conversion methods. However, those methods are currently characterized by higher direct total costs per unit of energy produced than the coal or uranium options. Thus, even though alternative energy sources could technically replace a large proportion of the energy obtained from uranium and coal, that replacement would very likely involve significant cost increases. Those increases may be justified by the benefits associated with avoiding the environmental dangers of using uranium and coal. But as long as there is significant uncertainty on what those dangers are, there can be little agreement on the real benefits of alternative energy sources and on whether those benefits justified the certain increases in energy costs.

In the final analysis, uncertainty is unavoidable. Risks are involved with any strategy for the use of resources and it is not evident what ought to be the social risk-benefit trade-off in general.

Government intervention

Under the broad sustainability criterion, the main role of the government should be to perfect markets (or to create them if they do not already exist). It is through well functioning markets that an efficient allocation of minerals and other resources can be made.

Under the narrow sustainability criterion, however, the role of government needs to be expanded beyond that required under the broad criterion to include imposing constraints to try to ensure the (narrow) sustainability of minerals. This type of intervention can be illustrated with the following example. According to Raymond (1986, p.150-151), the various demands by the ship building, glass making, and iron industries on the English forests created a crisis that persuaded the government to pass a law in 1558 forbidding:

`the felling of trees to make coals for the burning of iron', but the Weald of Kent and Sussex was exempted, perhaps because of lobbying by the thriving iron industry in that area. And still the price of wood continued to climb. In 1559 a writer complained that the price had risen from a penny to two shillings a load `by reason of the iron mills'. ... Iron makers were forced to go on using charcoal, regardless of its still rising price. The inevitable result, towards the end of the 1600s, was that Britain, an island rich in both iron ore and carbon fuel, found itself suffering industrial stagnation. The urbanisation of society and the growth of the economy were frustrated by the restriction of supplies of the key metal, iron.

Coke eventually provided the needed back-stop technology to replace charcoal as energy source and reducing agent in iron making. But neither this nor other back-stop technology was known to exist at the time the Weald of Kent was being cut down.

It is doubtful that the cutting of the weald would have been permitted under the narrow sustainability criterion today because of its environmental impacts. In the example described in Raymond (1986), however, the government's main concern was not so much the sustainability of the environment (which seems to have been maintained) but the decreasing ability of the weald to supply essential (at that time) raw materials for various industries. That government restrictions failed to avert a crisis demonstrates the complexity of regulating markets and predicting outcomes. In fact, it is possible that the sense of crisis itself gave impetus to the search that would culminate with the use of coke. Without that crisis, complacency may have deterred seeking charcoal substitutes.

Hence, a serious dilemma emerges under the narrow sustainability criterion in that government intervention may be necessary to ensure mineral sustainability while it is difficult to see how that intervention can improve on a well functioning market. For example, once a mineral resource has been identified as increasingly scarce (through a secular growth in prices, for instance), should the government intervene to give tax incentives to foster exploration for that mineral? Probably not as this may discourage the search for substitutes and accelerate the exhaustion of domestic ores. Should the search for substitutes be publicly funded instead? Probably not for there is no a priori reason to believe that the government would be in a better position to identify the best research projects ('to pick winners') than private groups.

In brief, government intervention is justified to encourage market efficiency or create markets if they do not exist. This is particularly important in the allocation of mineral rights (as the government owns those rights) and environmental services (as the government has become the de facto owner of many of those services or is otherwise involved in their allocation). This is all that is required by the broad sustainability criterion. In addition to those forms of involvement, however, it is not possible to identify government actions that would a priori improve on the allocation of resources. This probably means that while it may possible to identify failing sustainability in a narrow sense, there may be little that the government can do to prevent it without misallocating resources.

Temporal

Strictly speaking, indefinite sustainability of any type is probably impossible. After all the energy source that maintains our ecosystem, the sun, will certainly burn out someday. But that fact is of little practical relevance to the sustainability of minerals or indeed problems confronting society today. An arbitrary finite time period for analysis must then be defined to discuss mineral sustainability. This period should probably span hundreds rather than thousands of years. This would rule out the need to take into account such factors as the potential benefits of current greenhouse-inducing activities on avoiding the probably disastrous results of a new ice age, or the potential effects of continental drifts on, for example, the burial of nuclear waste, or the effects of mining on other planets or the earth's core. It is considered here that given the completely speculative nature of such events, it is more productive to focus the limited resources invariably available for the analysis of any problem on more immediate and tractable problems.

On the other hand, the minimum time period to discuss sustainability should be measured in decades rather than years or shorter intervals. Events such as the change in temperature from one season to another or the usual annual increase of oil prices during the Northern Hemisphere winter are clearly of little relevance to sustainability. Other processes, such as the mineral exploration-production-(local) depletion process, are cyclical in nature and should not affect sustainability either. However, given their longer characteristic frequency, those cyclical processes give origin to difficult analytical problems. For example, the exploration-production-(local) depletion process may involve several years of rising prices as existing mining operations deplete their working inventories (mineral reserves). Eventually higher prices induce technological progress and new exploration that may eventually result in findings, increased supply and lower prices. In the meantime, however, the observed rising prices can easily be misunderstood as a signal of the onset of global mineral resource exhaustion. On the other hand, exhaustion could in fact be occurring and rising prices may not be part of a cycle but an indication of a secular trend. The analytical difficulties this possibility creates should be evident.

Even after new ore deposits are identified, significant time may be required to fully defined the ore body or bring it into production. According to AMIC (sub. 95, Attach 5, p.6):

Olympic Dam, discovered in 1975 after several years of exploration, is not reflected in the economically demonstrated resources until 1984, after a very exhaustive reserve assessment program and production from this deposit did not begin until 1988.

Moreover, material substitution also involves long lead times even in those cases when replacement of one material for another is relatively straightforward. For example, it became obvious early this century that, for a given amount of energy to be transmitted, aluminium cables were a lower cost alternative than copper cables. However, it took a sustained research and marketing effort by Alcoa during several decades to develop and gain acceptance for aluminium-conductor steel-reinforced (ACSR) cable. In fact, it was not until 1952 that ACSR cables displaced completely copper cables in new transmission lines; half a century after such an event had been predicted.

Thus, policy makers should not allow themselves to be drawn into a futile and totally speculative debates about the distant future. Nor should they believe that events spanning only few years can unambiguously point out to the success or failure of policies in support of sustainability. And they should be under no illusion that policy initiatives they take will have immediate visible effects on sustainability.

Spatial

Mineral sustainability can only be analyzed in a global context because the depletion of individual ore deposits has proved in practice to be immaterial to the fate of mining as a whole. According to Morse (1976, p.245):

It is true that individual deposits will be exhausted, at least in an economic if not physical sense. But this poses no unique problems. Any enterprise must look forward to the eventual death, retirement, or departure of its most valuable workers and executives, all of whom are unique and irreplaceable in some sense. Yet enterprises confronted by this inevitable prospect do not act as if they would go out of business when it occurs. Instead, they count on being able to find or develop effective replacements. Similarly, mining enterprises seem to adjust to the exhaustion or deterioration of particular mineral deposits by finding or developing effective alternative sources of supply, or effective substitutes.

Attempting to achieve mineral sustainability at the level of a nation would probably be inefficient and very costly. It is true that, on occasions, nations have found it necessary to attempt mineral self-sufficiency. For example, faced with copper shortages, Germany attempted (unsuccessfully) to replace copper cables with iron cables during World War I. During World War II, facing this time crude oil shortages, that country managed to produce substantial amounts of liquid fuels from coal. South Africa, confronted with similar shortages as a result of the current trade embargo, does the same nowadays. Those experiences indicate that unusual substitution possibilities can be exploited by a nation to maintain the services provided by locally unobtainable materials. It is not a coincidence, however, that those substitution attempts have been undertaken only in extreme circumstances, for the cost of such a policy is high indeed.

Australia is a country rich in many mineral materials. Attempting to ensure mineral sustainability in this country alone would be a misguided policy. Among other things, it would imply restricting foreign trade and forgoing many of its benefits. After all, the easiest way to extend the life of local ore deposits is to ban exports. Past attempts to restrict exports to conserve minerals for domestic consumption do not seem to have been successful. For example, Barnett (1979, p.201) has suggested that if the iron ore embargo imposed in the 1940s and 1950s:

... had been lifted ten or fifteen years earlier, or never imposed, it is possible that the Australian industry's growth would not have been very different. Certainly any exports to Japan from Yampi Sound would have stopped with the bombing of Pearl Harbour. Alternatively, spurred on by World War II's demand for steel, the incentive to export to the Allies may have led much earlier to the discovery of the Pilbara deposits. Australia may have been able to build a large export-oriented steel industry and have avoided the present problem of small capacity, high-cost iron and steel plant.

Banning exports also poses a difficult ethical problem for, as stated by the Victorian Chamber of Mines (sub. 21, p.10):

Being natural resource rich, thinly populated but economically advanced, Australia should be prepared to continue to be a major supplier in its own and the global interest of mineral products for sustaining and enhancing the living standards of a growing world population.

The above does not mean that there is nothing Australian can do to help ensure mineral sustainability. Australian firms can actively participate in mining projects around the world. Several domestic mining companies are doing that already, exploring, developing and producing minerals in numerous countries. The domestic industry can also make contributions by developing new mining and processing technologies including those aimed at decreasing the environmental impacts of mining activities. Furthermore, local research into materials science and basic science aids finding new substitutes and contributes to the continuous and so far successful creation of mineral resources world-wide.

8.9 Conclusions

It has been argued that sustainability can be interpreted under broad and narrow criteria. Under a broad interpretation, sustainability becomes an economy-wide concern that exploitation of natural capital (in the form, for example of mineral deposits) is offset by conversion of at least part of this wealth into other forms of capital (eg infrastructure or other physical or social investments), so as not to impoverish succeeding generations. Under this view, no measure of sustainability for specific sectors (such as mining and mineral processing) is applicable and technological change in mining is not required to compensate for the depletion-inducing effects of mineral production.

A narrow sustainability criterion imposes a limit on the substitutability allowed between natural resources and other forms of capital. In relation to minerals, for example it would require that the rate of technological change in mining counteracts the depletion-inducing effects of production and consumption. Operationally, this rule would mean that the real price of minerals does not increase over time. There is evidence suggesting that this has been the case during most of this century. In other words, there is evidence that mineral production has been sustainable in a narrow sense. (However, see below.)

The major implications of mineral production on sustainability appears to be not so much its effect on mineral sustainability per se, but rather its effect on ecological systems adversely affected by such production. Thus, it is imperative to ensure that the mining and mineral processing industry (and all other users of the environment) are made fully accountable for the environmental impacts associated with their activities. There is some evidence that such accountability is expanding, and that this process is resulting in increasing mineral prices and failing (narrow) mineral sustainability.

Under the broad sustainability criterion, government intervention is justified to improve market efficiency or create markets if they do not exist. This is particularly important in the allocation of mineral rights and environmental services. In addition to those forms of involvement, however, it

was not possible to identify government actions that would a *priori* improve on the allocation of resources. This probably means that while it may possible to identify failing mineral sustainability in a narrow sense, there may be little that the government should do to prevent it.

Finally, a constructive analysis of sustainability requires avoiding short-run phenomena or speculative debates about the distant future and should take place in a world-wide context. Attempts to ensure mineral sustainability at the level of the nation are not justified. Also unwarranted are efforts to try to determine the `true' income component of net mineral revenues unless technology is properly accounted for. How this can be done in practice is not clear.

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8A SCARCITY AND MINERAL PRICES

Contrary to what intuition or common sense might dictate, real metal prices have tended to fall rather than rise over the long run - a trend which challenges the logic of those who advocate a 'keep it in the ground' approach since this argument commonly relies for its rationale on the presumption that the minerals will become much more valuable later.

The finite nature of minerals in the earth's crust suggests that prices should rise over time to reflect increasing scarcity due to the cumulative depletion of orebodies.

This is the type of reasoning which underlay classical economic thinking in the eighteenth century (eg Malthusian beliefs) and, more recently, the idea that we are rapidly approaching environmental limits to growth. This 'limits-to-growth' debate commanded considerable public attention in the early 1970s and interest in the proposition has recently rekindled. The original proposition (associated with groups such as the Club of Rome (Forrester 1971, and Meadows et al 1972)) was that the increasing levels of material well-being which had been enjoyed by the inhabitants of some countries since the industrial revolution could not become universal because of unavoidable constraints set by the natural environment.

But while the intuition that increasing scarcity must eventually drive up prices is sound, other considerations in the case of minerals - such as new discoveries, substitution and recycling possibilities and the potential for cost-reducing technical advances to work in the other direction - complicate the inexorability of this logic.

This attachment looks at the scarcity issue from two perspectives. The first is from a physical (geological) vantage point, whereby geologists classify mineral resources into various categories in terms of prospects for future production. The second is from a market perspective whereby evidence of scarcity is looked for in terms of (real)¹ increases over the long run in extraction costs and the prices which the products of mineral processing have commanded on world markets.

8A.1 Measuring resource scarcity

Reserves versus resources

Although involving increasingly speculative judgments, geologists classify known and inferred mineral stocks by their estimated degree of certainty of being converted into economic production (ie at marginal costs of production which do not exceed levels justified by market prices commanded by their ultimate products). Resource supplies exist, therefore, in a spectrum from proven economic reserves to inferred resources which may or may not turn out to be valuable as future exploration, technology and market prices unfold. Obviously, the further into the future one goes, the less clear the supply picture becomes.

¹ This is, adjusted for the effects of inflation.

A major contributing factor to uncertainty in establishing the extent of available resources is that, in the case of operating mines and mines which are on the verge of production:

... once sufficient economic volumes of ore are identified in an orebody to support development, it is unnecessary and unprofitable to identify further reserves until they are needed. In most major mines, new reserves are continually proven up at a rate capable of supporting 15 or 20 years production. (Department of Energy, Mines and Resources 1981)

In Australia, the Bureau of Mineral Resources, Geology & Geophysics (BMR) classifies known (identified) mineral resources according to both their degree of assurance of occurrence (based on estimates of tonnages and grades) and their economic feasibility of exploitation (based on variables such as commodity prices and operating costs). Undiscovered mineral resources are classified as either hypothetical or speculative. The classification system used by BMR is shown in Figure 8A.1².

BMR has been preparing assessments of Australia's known mineral resources since 1975. A 1988 assessment is shown in Table 8A.1. Graphs based on data supplied by BMR showing Australian economic demonstrated resources (EDRs)³ for the period 1975 - 1988 covering black and brown coal; bauxite; cobalt; copper/lead/zinc; diamonds; gold; iron ore; mineral sands; antimony and cadmium; nickel; manganese ore; silver; tin and tungsten; and uranium appear as Figures 8A.13-8A.26.

Commenting on the EDRs at the 1990 National Agricultural and Resources Conference, the then Associate Director of BMR (Dr Peter Cook) had this to say:

It is evident that EDRs are adequate in terms of current production for most resources, though this provides no grounds for complacency when it is remembered that present day EDRs are for the most part the result of exploration undertaken 10 to 20 years ago, and that the mineral exploration industry, more than most, requires long term strategies and commitment. The EDRs of most major commodities has increased over the last 10 years. However, it is necessary to point out that in 1988 the Australian mineral industry adopted a new code for reporting identified mineral resources and reserves and that consequently the data for 1989 are not directly comparable with those for previous years.

The high level of uncertainty which necessarily attaches to estimates like those presented in Table 8A.1 (and similar tables on a world scale) leaves room for either optimism or pessimism when assessing the prospects for scarcity in a physical sense. Future production will increasingly depend on resources not yet considered to fall into the EDR category, and may even come to rely on minerals existing in very low concentrations in common rock.

² The system adopted by BMR is described in an article entitled 'BMR refines its mineral resource classification systems' which appeared in the *Australian Mineral Industry Quarterly*, 36(3), pp. 73-82.

³ Resources in this category are sufficiently well delineated for mining to be planned and carried out, and are currently economic. In other words, it is the category of resources from which almost all mine production comes.

A key point that can be made about estimates of physically available resources, apart from their uncertainty, is that continued production will increasingly involve exploiting minerals of much lower grade than the quality of existing reserves. Whether or not production costs must therefore rise in the future will depend on the ability of technological progress to offset declining grades.

So what has been happening to mineral prices over the long run since, retrospectively, the same forces have been at work in some cases for centuries.

Cost-price measures of scarcity

Perhaps not surprisingly, when confronted with questions of natural resource scarcity economists have tended to supplement uncertain estimates of physical supplies with examinations of long-run cost and price trends for natural resource commodities relative to other goods and services.

Current-dollar price paths for many metals are broadly similar to one another. In general, prices reached a minimum around the turn of the century. There were sharp price increases around World War I, dramatic declines during the depression, and increases again after World War II. The 1950s and 1960s, which were periods of relatively stable prices, were followed by the commodity boom of the early 1970s, when the prices of many metals reached unprecedented highs. After a decline, there was another rapid increase in the prices of many metals in the early 1980s. As with the earlier boom, much of the activity was fuelled by speculation. The silver market played a particularly important role in the latter boom. Since that time, prices have again declined. Current-dollar (or nominal) prices are represented by the dashed lines in Figures 8A.2-8A.8.⁴

Current-dollar prices of minerals are highly correlated with economy-wide rates of inflation. To detect patterns that are unique to the metals, therefore, it is necessary to abstract from general price movements. This is usually done by dividing each current-price series by an appropriate index reflecting general price movements - in this case Slade has chosen to deflate by the US wholesale price index (1986 = 1.0). The result is a set of real (or constant-dollar) prices - that is prices expressed in terms of a dollar of constant value or purchasing power. It is these constant-dollar prices and the trends they have displayed over time which are of primary interest in this appendix. Real price paths are represented by the solid lines in Figures 8A.2-8A.8.

While each metal has a unique price path, Certain general tendencies emerge from observation of the diverse behaviour patterns. The most important factors that affect long-run trends in metal prices are growth of metal demand, changes in mining and metallurgical techniques, discoveries of new deposits and depletion of high-grade orebodies. The first three factors tend to predominate in the early phases of a metal's life cycle, whereas the fourth may be more important later on. Thus it can be expected that real metal prices will initially fall but, unless close substitutes can be found, they may eventually rise. Certainly the empirical evidence points to a decline in real-metal price up until the middle of this century (Barnett and Morse 1963, Barnett 1979, Slade 1982 pp.122-137). Slade summarises the reasons why this might be so in the following terms.

⁴ Most of the price series shown in the graphs are producer prices.

In the initial phase of a metal's commercial history, many factors can contribute to falling costs. Metal mining and processing is characterised by substantial economies of scale. For example, a single mine can supply 10 per cent of current consumption of some metals. When the market is new, mines and smelters tend to be too small to capture all available size economies. The growth in demand as additional metal uses are discovered, therefore, allows mining companies to exploit cost-lowering economies of scale.

Learning-curve effects can also be important. As companies gain experience in mining, smelting, and refining, they may discover new techniques that lower costs. Costs may therefore fall with cumulative metal production. In addition, there may be improvements in extractive and metallurgical technology that are not specific to an industry but may be applicable across broad groups of industries. For example, the discovery of froth flotation lowered processing costs for many sulfide minerals.

Technical change can take place on the production or on the consumption side of a market. If it occurs on the production side, it generally lowers costs and therefore price. If it occurs on the consumption side, its effect is more ambiguous. It can, however, increase metal demand and allow mining companies to exploit economies of scale. When this is the case, the change will exert downward pressure on price in the long run.

The discovery of new deposits can increase metal supply and cause prices to fall. Even when new discoveries do not lower prices immediately, the expansion of known reserves can postpone the onset of higher costs due to the depletion of high-grade orebodies.

There are thus many factors that can lead to falling real metal prices. A comparison of Figures 8A.2-8A.8 shows that aluminium is the commodity that has exhibited the most dramatic real-price declines of the group of metals.

The period when the trend is downward is often followed by one where the trend is flat or nonexistent. This period can be very long, as for lead and zinc, or fairly short lived. In this trendless period, production growth rates are often steady but not dramatic, and the average grade of ores mined falls only slowly.

Unless close substitutes can be found, however, a final phase of rising prices can occur. As high-grade deposits are depleted, newly discovered deposits often tend to have lower metal content, be more deeply buried, of lower grade, or occur in thinner veins. In addition, if prices are to rise, the rate of introduction of cost-lowering techniques must be insufficient to offset the rise in costs due to depletion. This has long been the case of tin and mercury, for example (not shown in the graphs). An increase in price will, in general, cause consumers to conserve on use, and therefore consumption growth may be small or negative for metals that experience rising costs due to depletion.

The copper industry illustrates the historic counterbalancing influences of improvements in technology and deterioration in ore quality in determining production cost. In the first 75 years of this century, the average grade of copper ores mined in the US declined from about 5 per cent to 0.7 per cent (US Bureau of Mines 1975). In spite of this decline in grade, real copper prices fell until about 1940. The fall in price was due to technological developments in the early part of the century, particularly the advent of large earth-moving equipment, which made possible the open-pit mining of extremely low-grade orebodies, and the discovery of froth flotation, which made concentration of low-grade sulfide ores economical.

By 1940, however, the switch to this new technology had reached its natural limits. Since that time, in spite of new mining and processing techniques, the decline in grade has become an important factor in determining cost. In recent years, technological emphasis has been on energy-saving features and improved environmental acceptability. The former lowers costs but the latter tends to increase them. These factors have contributed to the post-war trend in real copper price which, with the exception of the mid-1980s, has been positive.

Petersen and Maxwell document the history of the relative impact of ore grade and technology on the cost of other metals (silver, tin, lead, zinc, and iron) and claim that these factors have been much more important than the discovery of new deposits in the historic determination of metal prices (Petersen and Maxwell 1979, pp.25-34).

Table 8A.1: Australian resources and mine production - major minerals ^a

	<i>Demonstrated</i>		<i>Inferred</i>	<i>Mine Production 1988</i>
	<i>Economic</i>	<i>Sub Economic</i>		
Bauxite (Mt)	5 543	2 376	3 500	36.4
Black coal (Gt)	50.8	2.0 ^b	very large	0.174 ^c
Brown Coal (Gt)	41.8	2.6 ^b	184 ^b	0.043
Copper (Mt)	6.5	12.3	22.5	0.24
Diamonds (Mct)	393	-	13	35.2
Gold (t)	1 486	1 237	263	153.7
Iron Ore (Gt)	14.3	13.4	17.7	0.096
Lead (Mt)	11.5	26.9	2.2	0.47
Manganese Ore (Mt)	118	381	132	1.976
Mineral Sands				
Ilmenite (Mt)	64.2	37.6	12.6	1.44
Rutile (Mt)	9.4	5.9	1.7	0.25
Zircon (Mt)	15.2	8.6	2.4	0.51
Nickel (Mt)	1.1	6.8	2.0	0.063
Phosphate Rock (Mt)	-	2 005	1 947	0.01
Uranium (kt)	474	58b	390 ^b	3.2
Zinc (Mt)	20.4	37.3	9.5	0.76

t -- tonne; kt -- 10³t; Mt -- 10⁶t; Gt -- 10⁹t

a Unless otherwise indicated, resources in the Economic Demonstrated category are recoverable; resources are in situ

b Recoverable

c Raw Coal

Figure 8A.1: BMR resource classification system

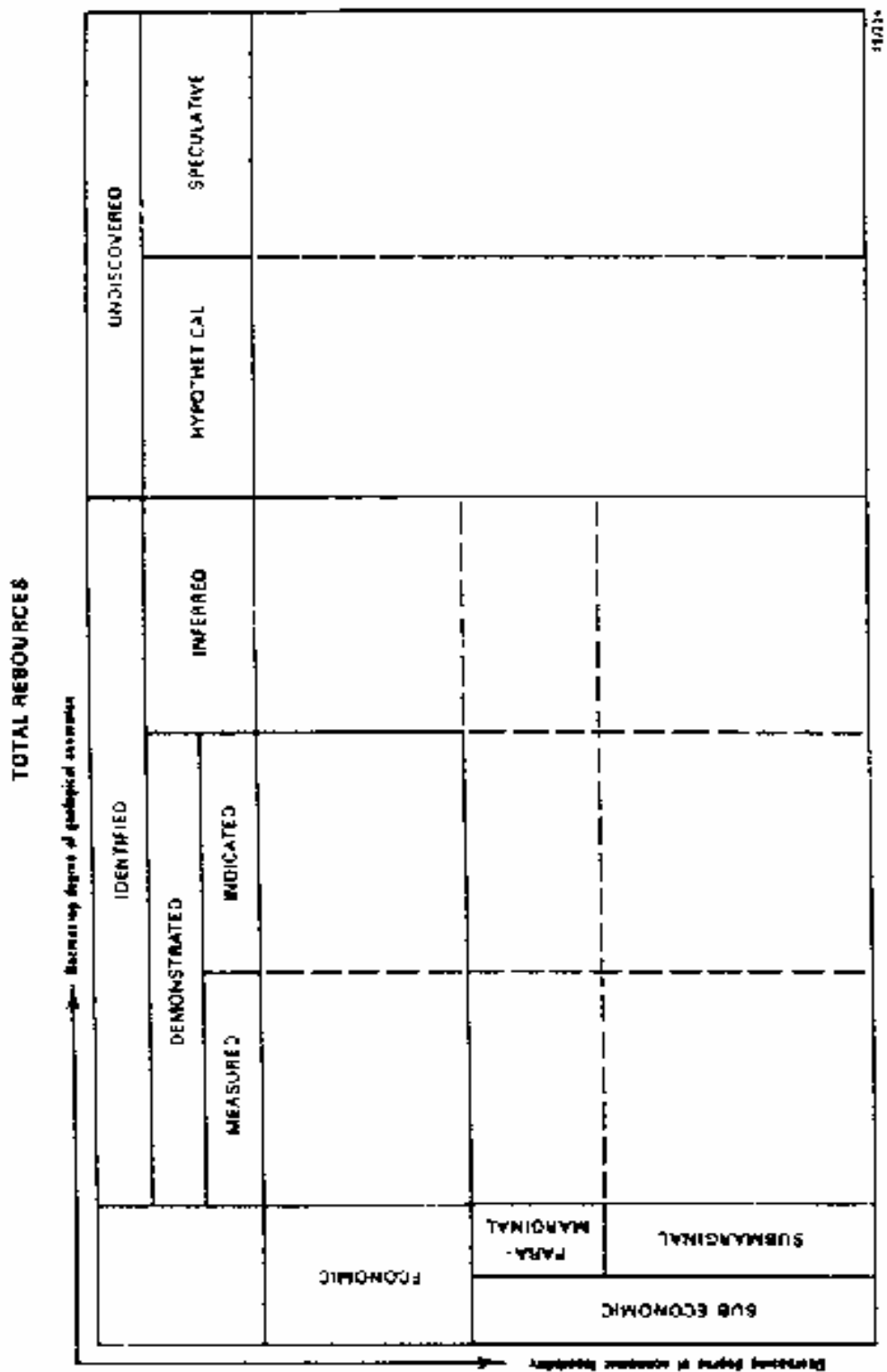


Figure 8A.2: Aluminium: real and nominal prices, 1895-1986, \$US

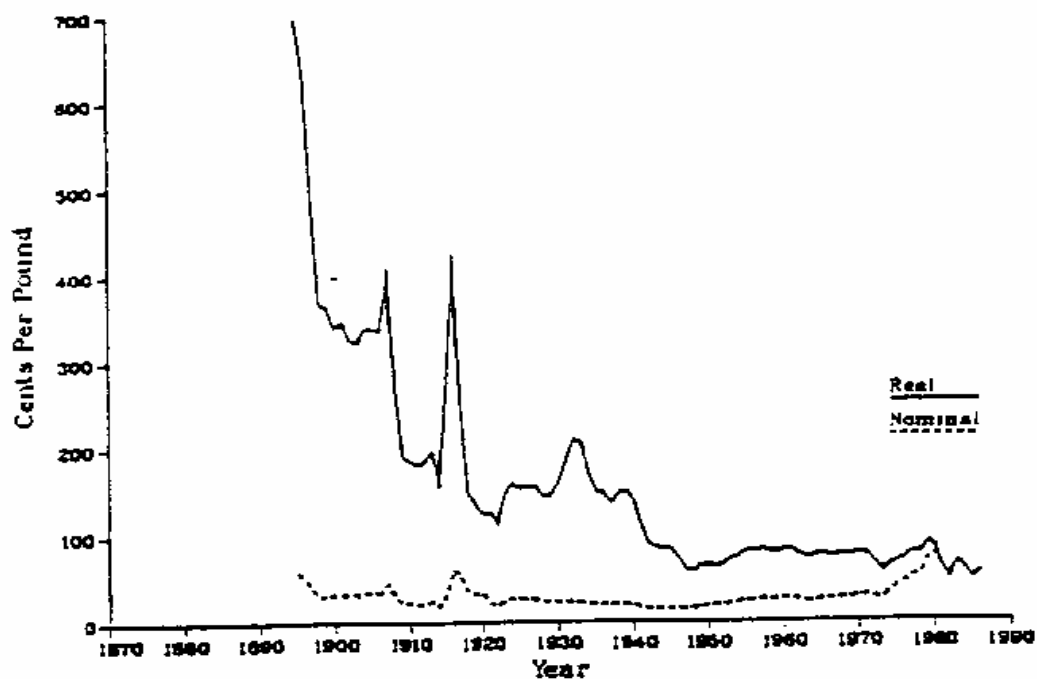


Figure 8A.3: Copper: real and nominal prices, 1870-1986, \$US

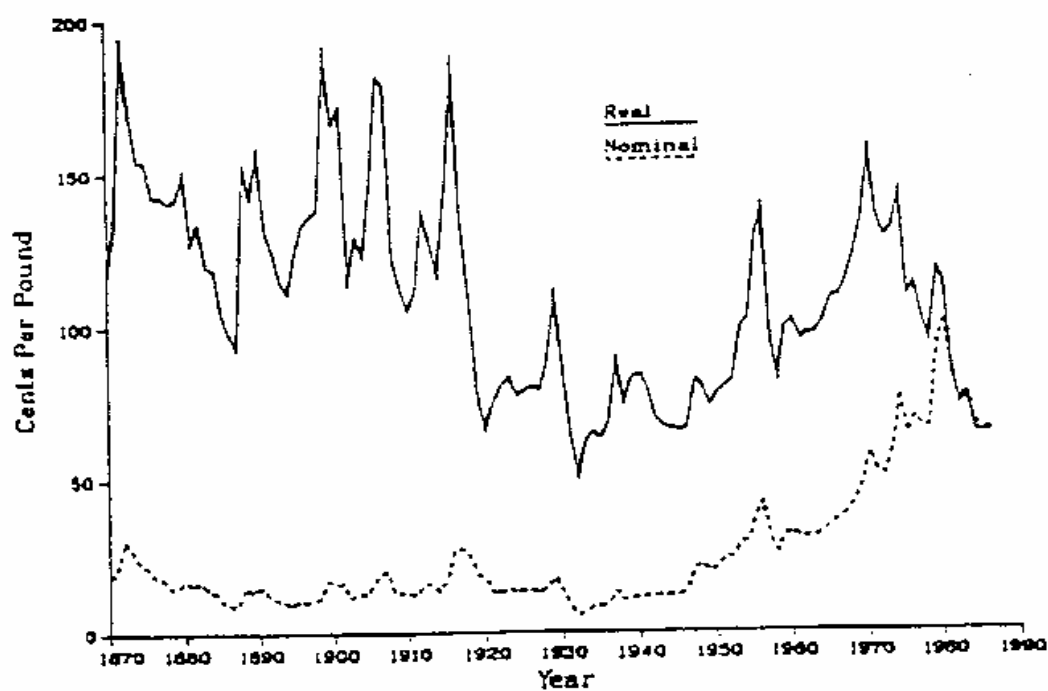


Figure 8A.4: Lead: real and nominal prices, 1870-1986, \$US

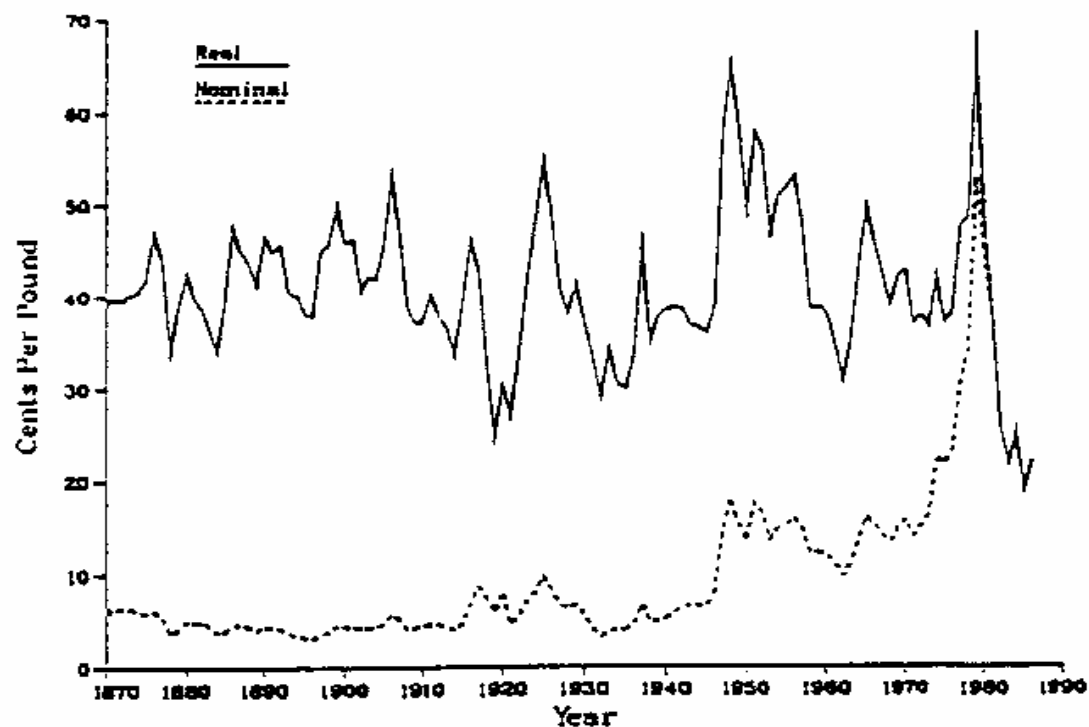


Figure 8A.5: Molybdenum: real and nominal prices, 1914-86, \$US

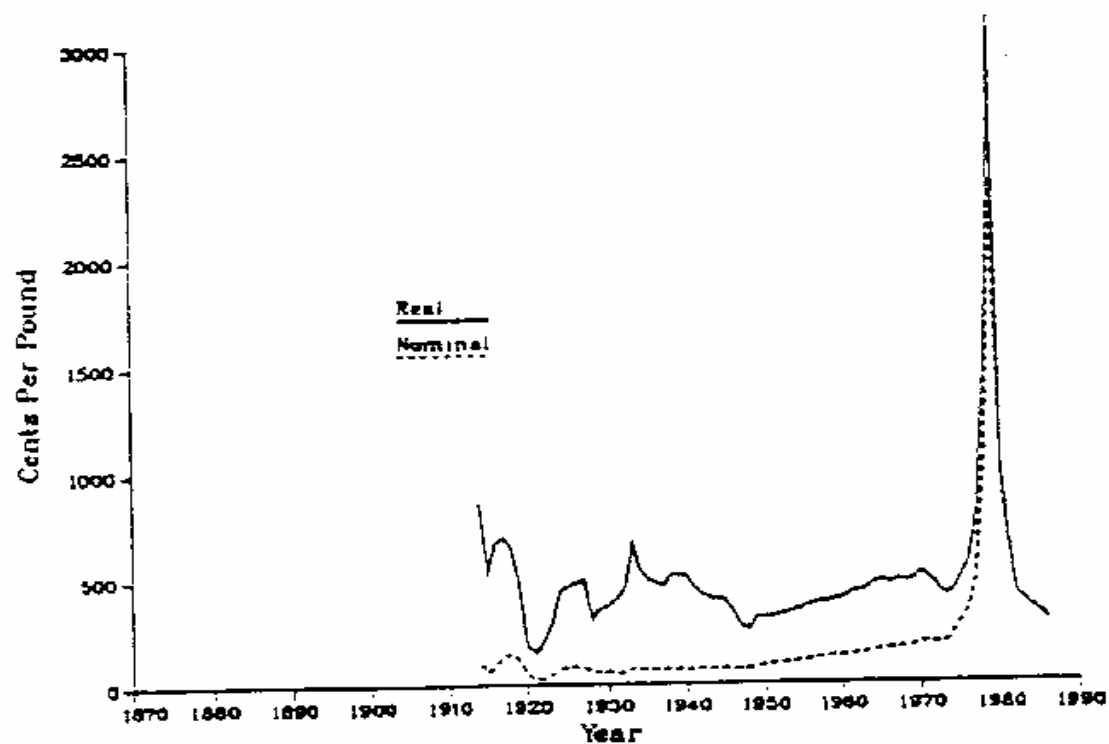


Figure 8A.6: Nickel: real and nominal prices, 1913-86, \$US

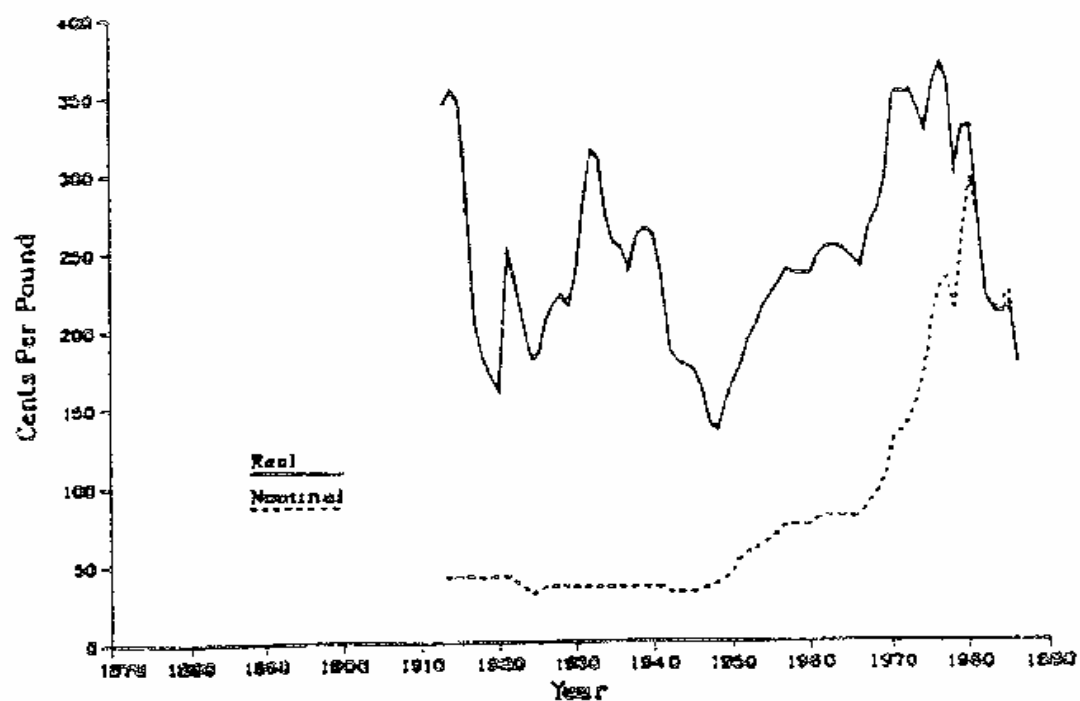


Figure 8A.7: Silver: real and nominal prices, 1870-1986, \$US

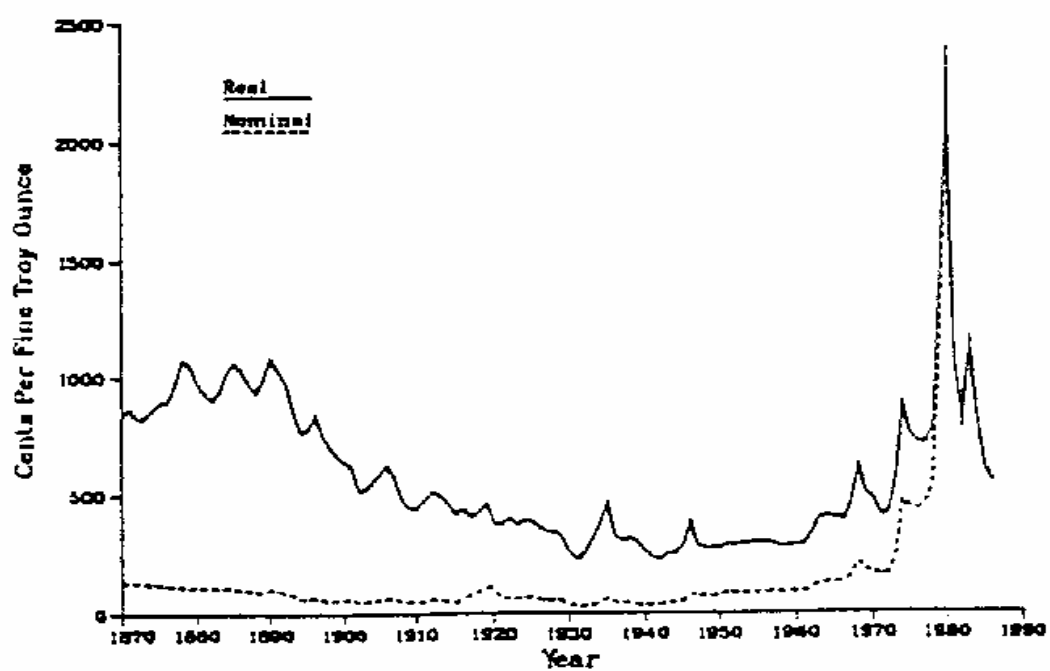


Figure 8A.8: Zinc: real and nominal prices, 1870-1986, \$US

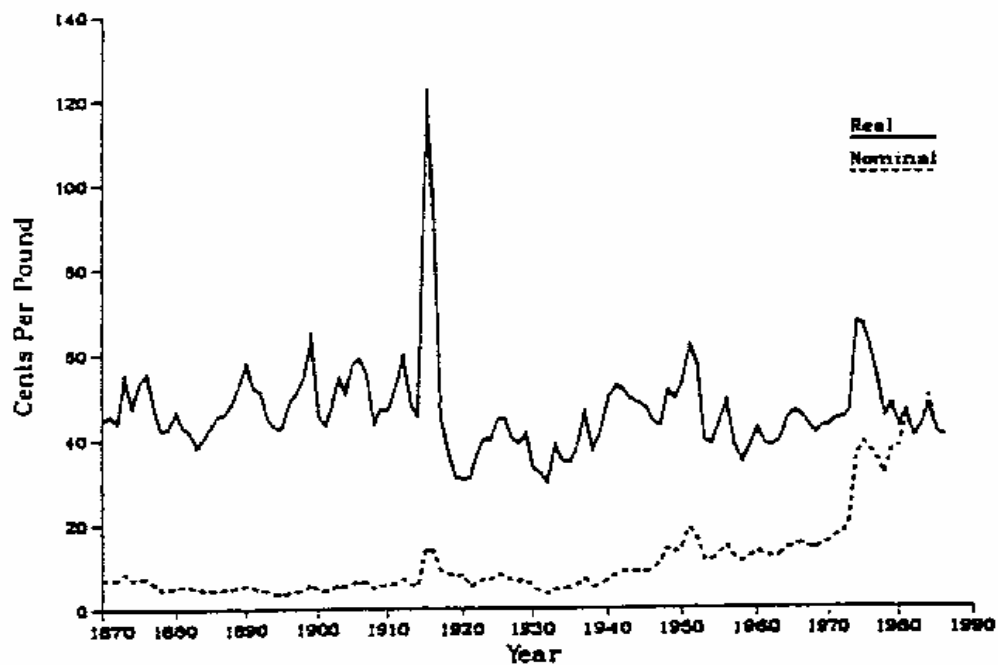
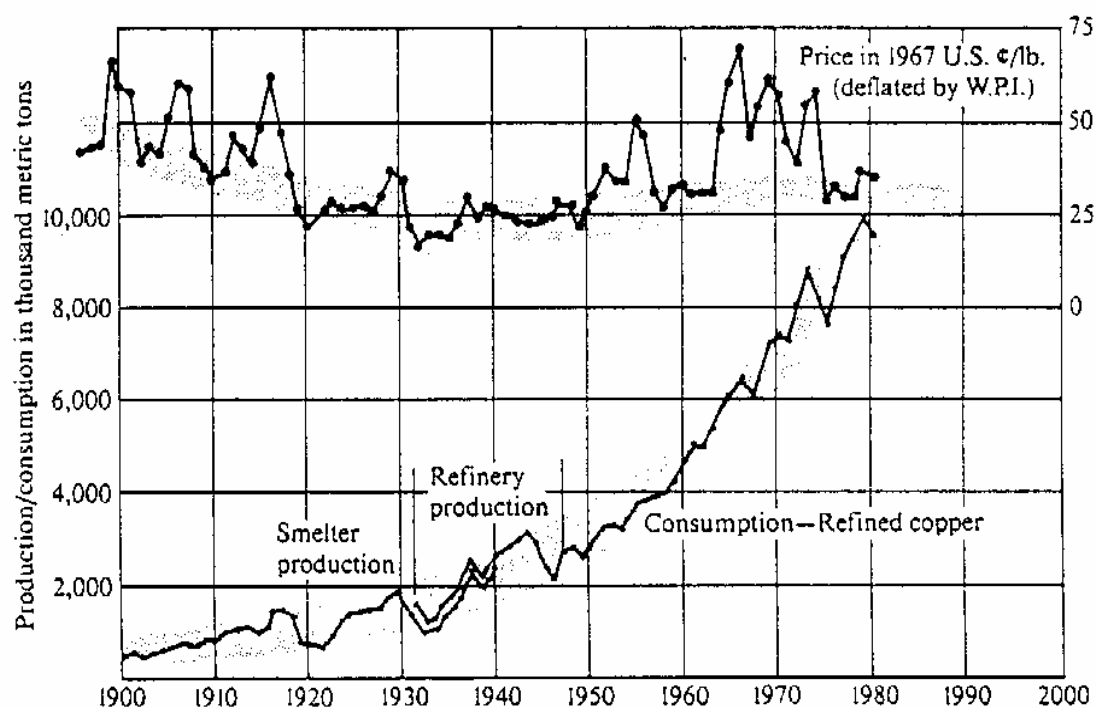
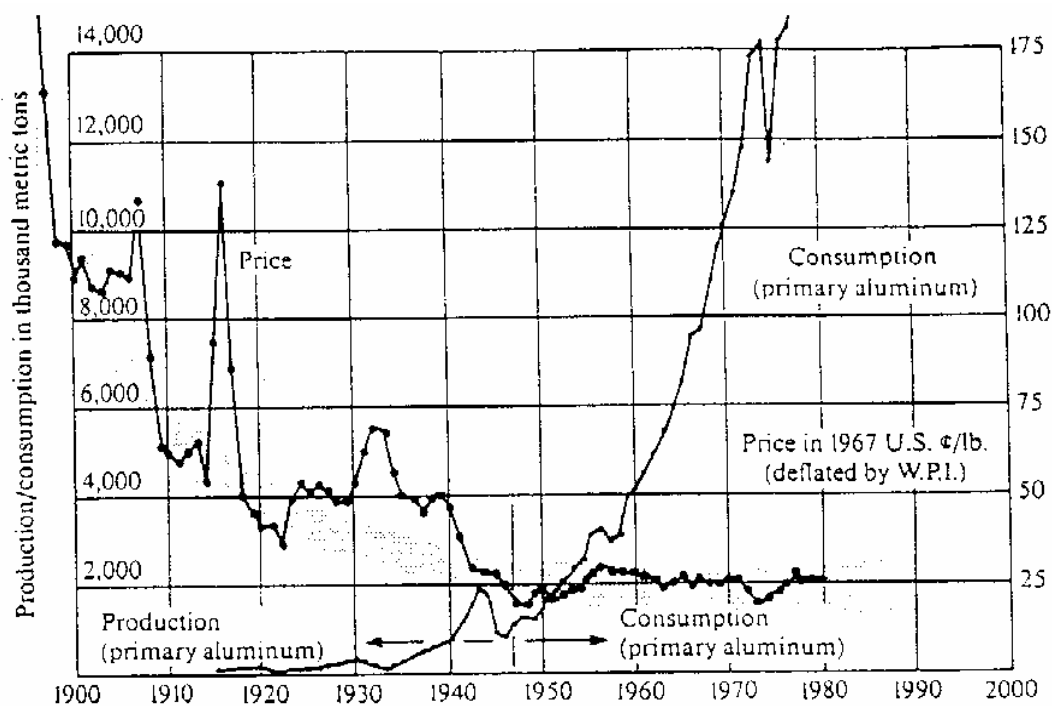


Figure 8A.9: World copper prices and consumption



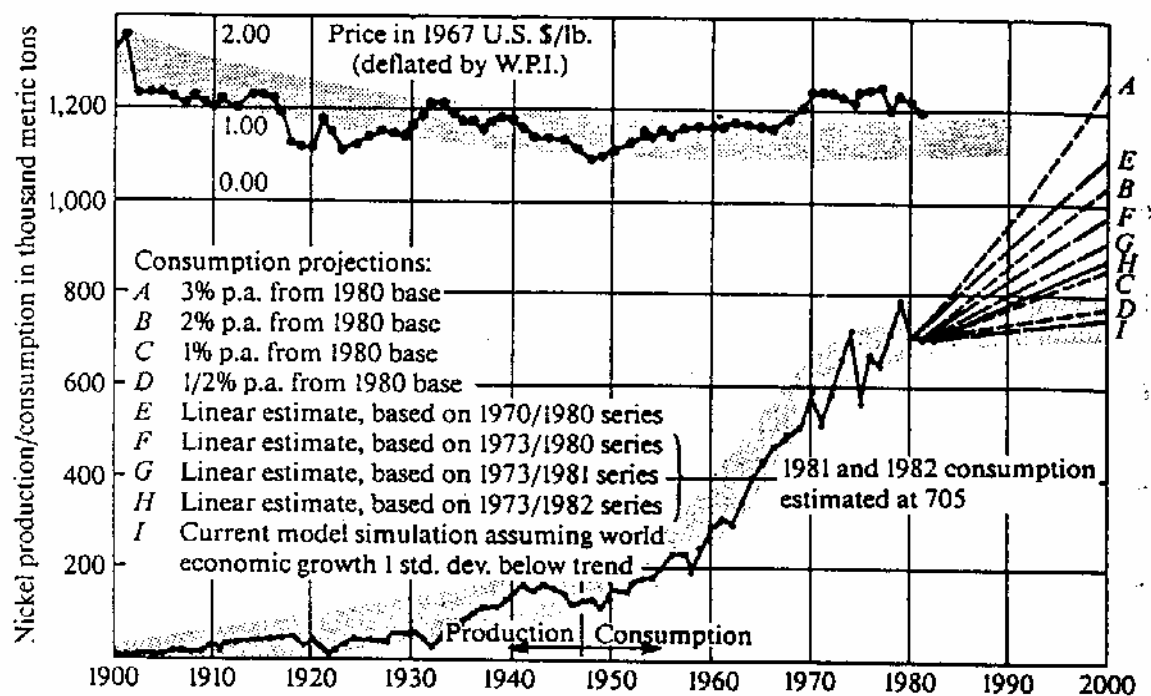
Source: Ontario Ministry of Natural Resources. *World Mineral Markets—Stage 2* (Oct. 1981).

Figure 8A.10: World aluminium prices and consumption



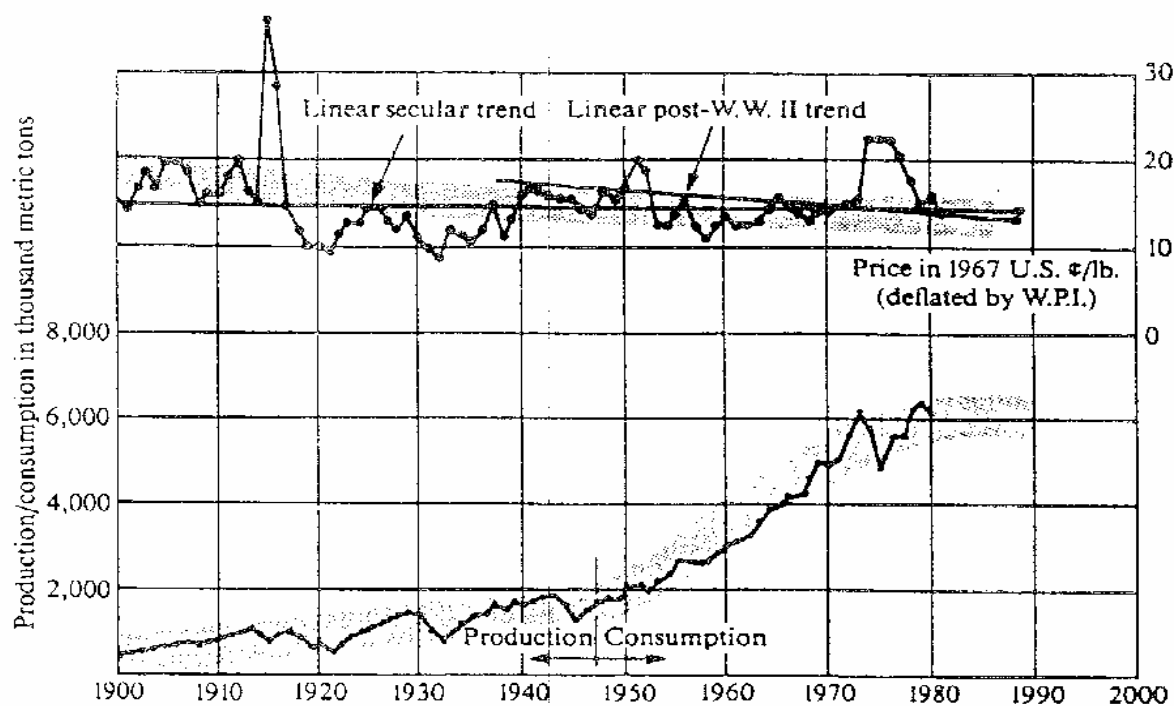
Source: Ontario Ministry of Natural Resources. *World Mineral Markets—Stage 2* (Oct. 1981).

Figure 8A.11: World nickel prices and consumption



Source: Ontario Ministry of Natural Resources. *World Mineral Markets—Stage 2* (Oct. 1981).

Figure 8A.12: World zinc prices and consumption



Source: Ontario Ministry of Natural Resources. *World Mineral Markets—Stage 2* (Oct. 1981).

Figure 8A.13: Australian economic demonstrated resources, black and brown coal, 1975-1988

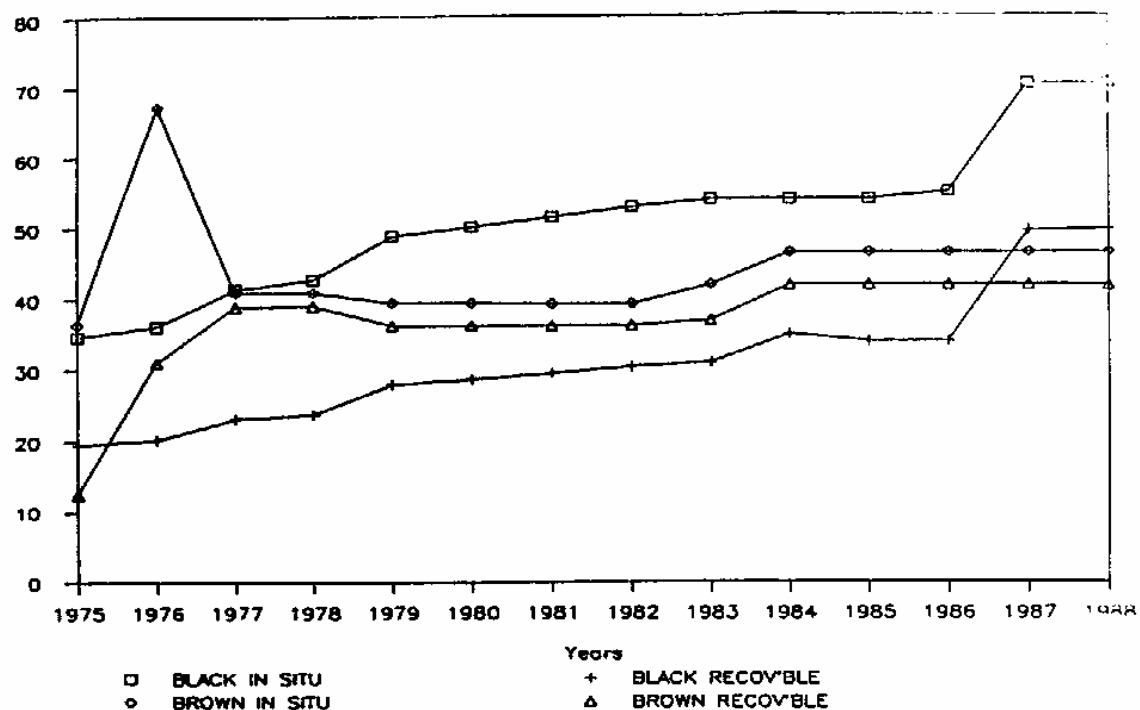


Figure 8A.14: Australian economic demonstrated resources, bauxite, 1975-1988

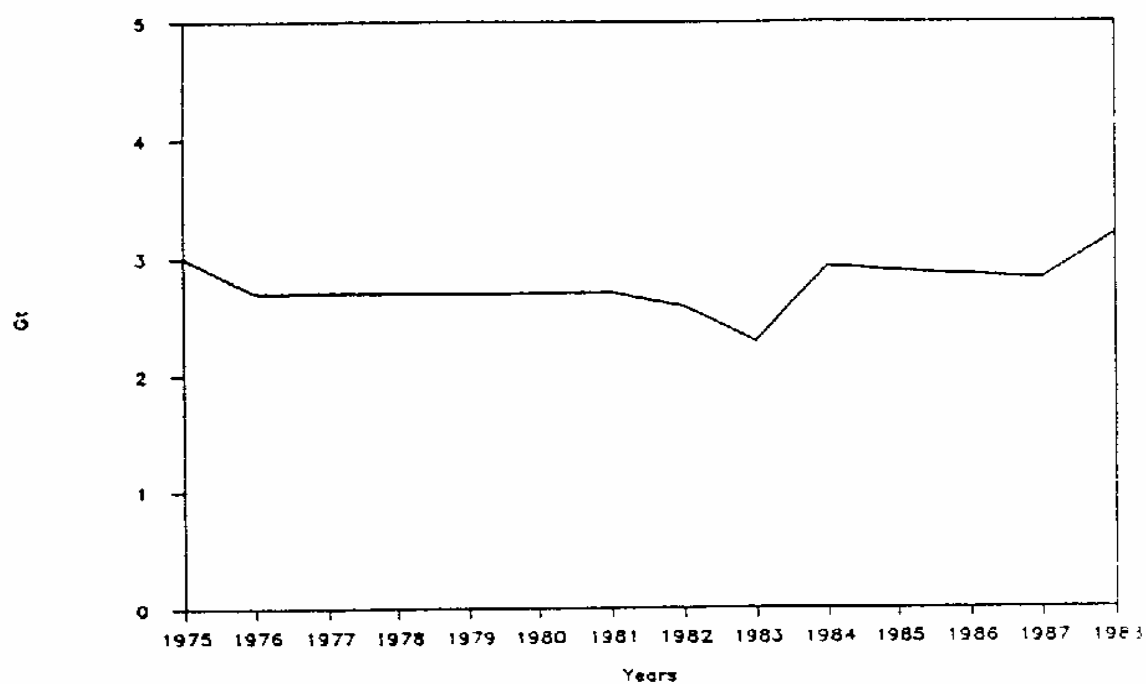


Figure 8A.15: Australian economic demonstrated resources, cobalt, 1975-1988

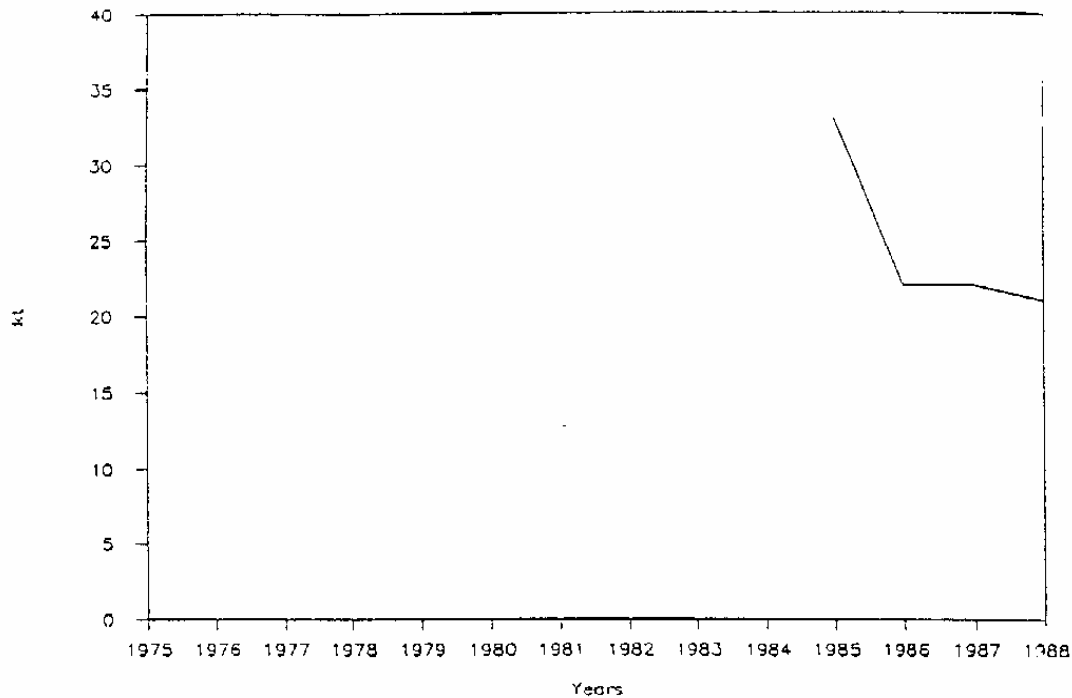


Figure 8A.16: Australian economic demonstrated resources, copper/lead/zinc, 1975-1988

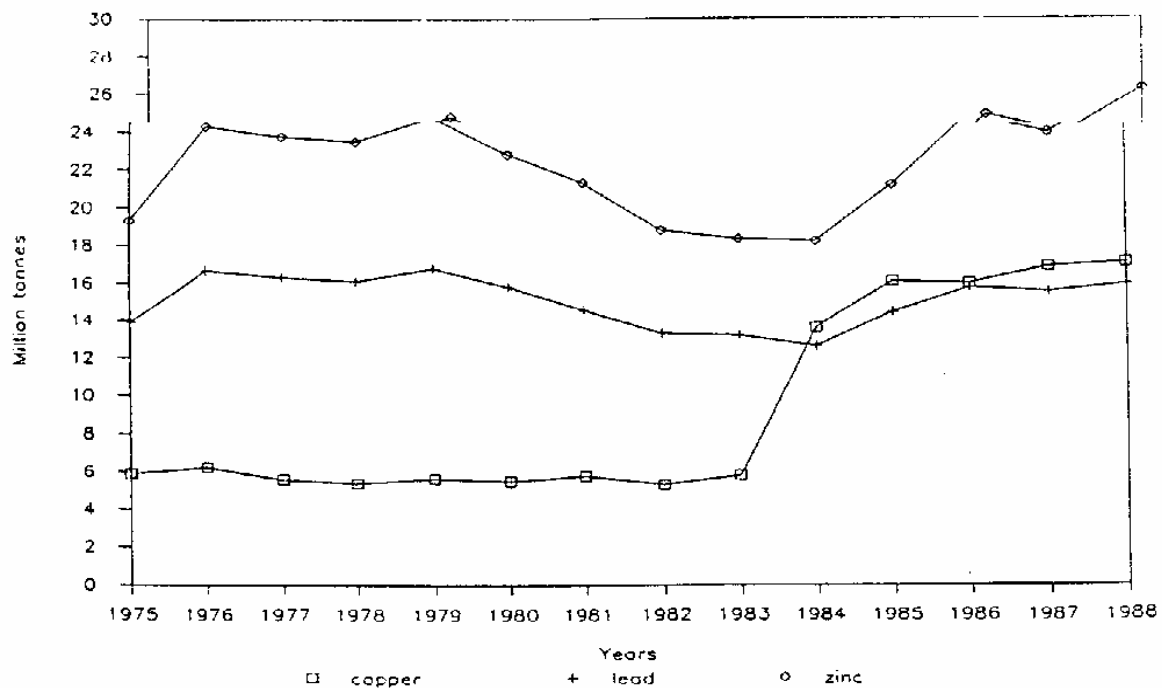


Figure 8A.17: Australian economic demonstrated resources, diamonds, 1975-1988

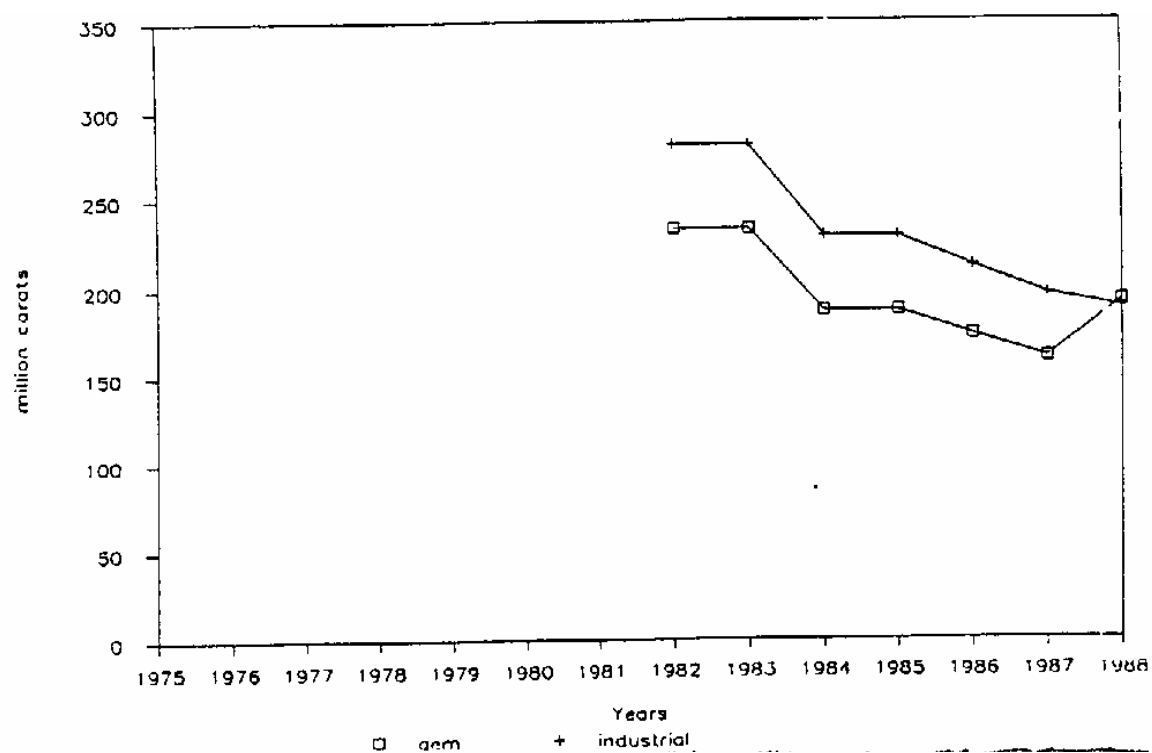


Figure 8A.18: Australian economic demonstrated resources, gold, 1975-1988

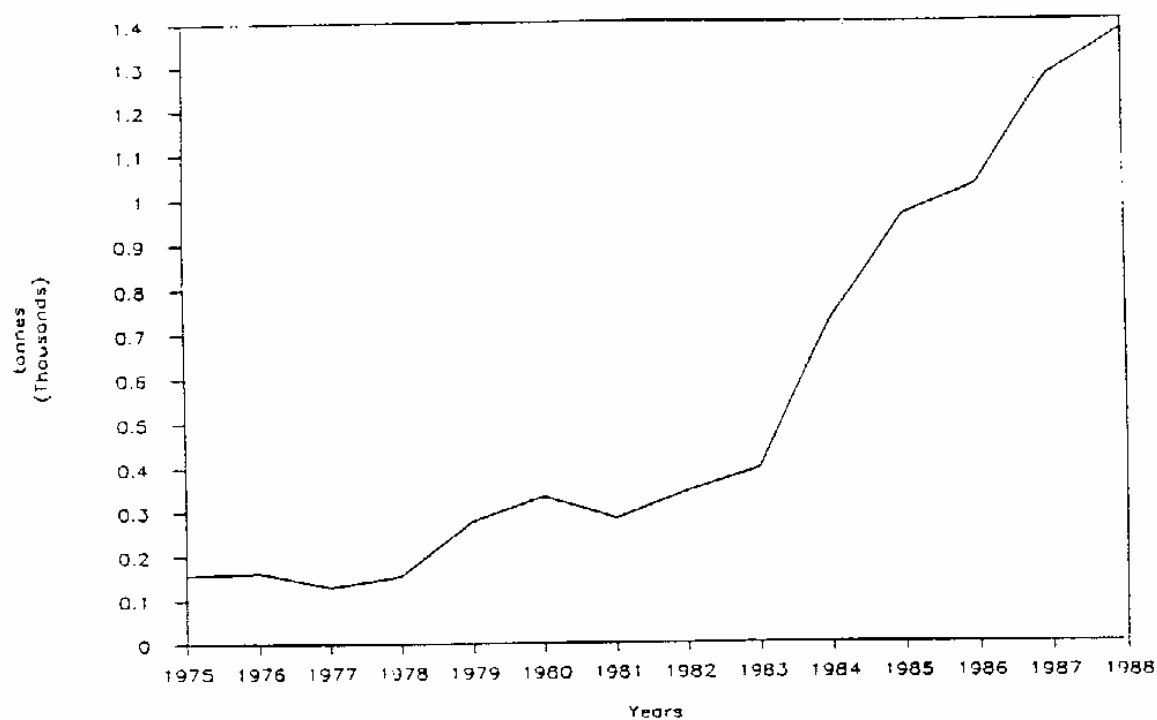


Figure 8A.19: Australian economic demonstrated resources, iron ore, 1975-1988

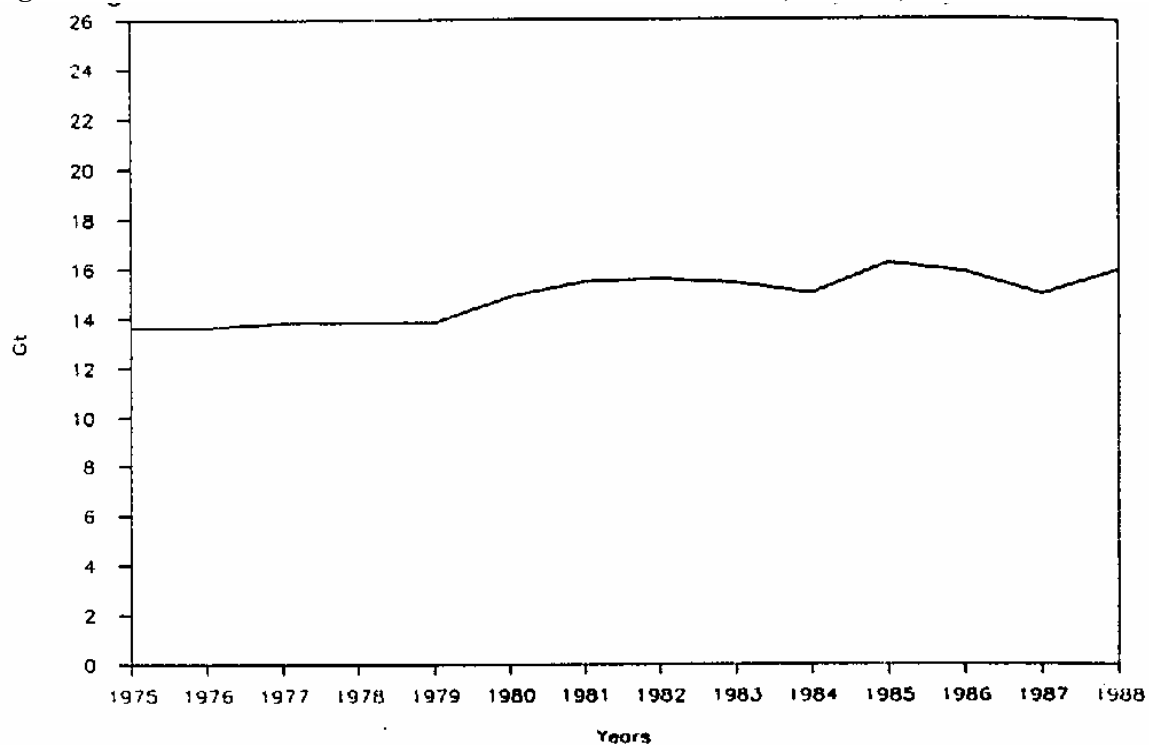


Figure 8A.20: Australian economic demonstrated resources, mineral sands, 1975-1988

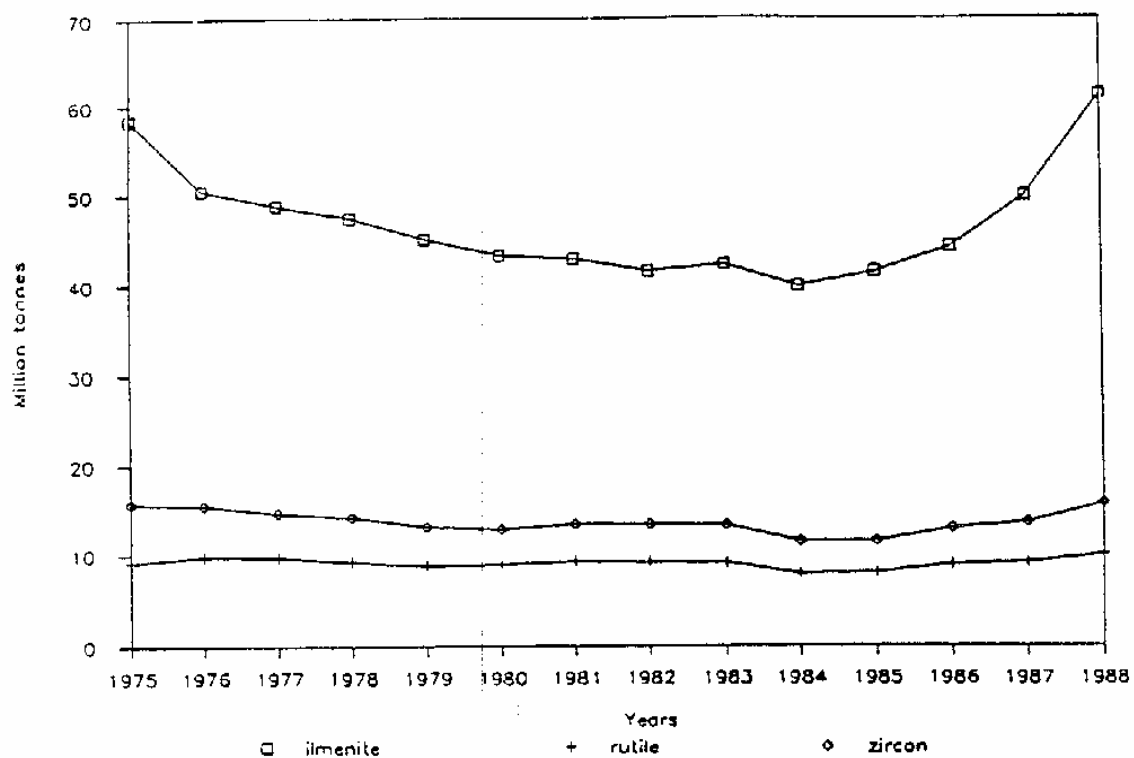


Figure 8A.21: Australian economic demonstrated resources, antimony & cadmium, 1975-1988

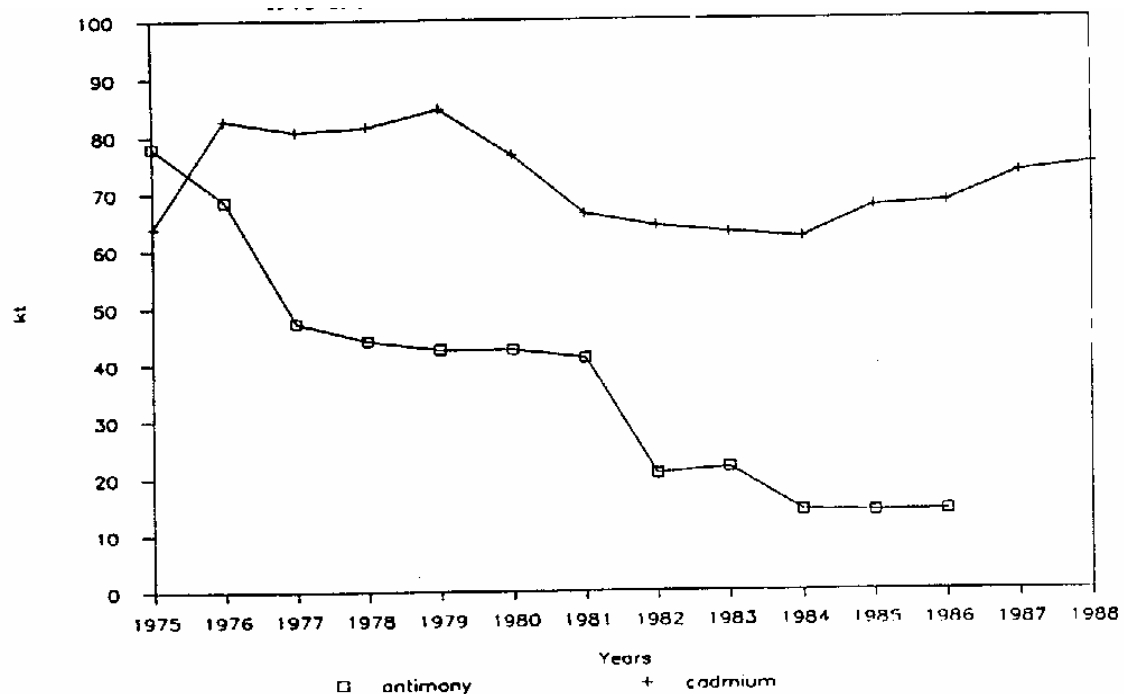


Figure 8A.22: Australian economic demonstrated resources, nickel, 1975-1988

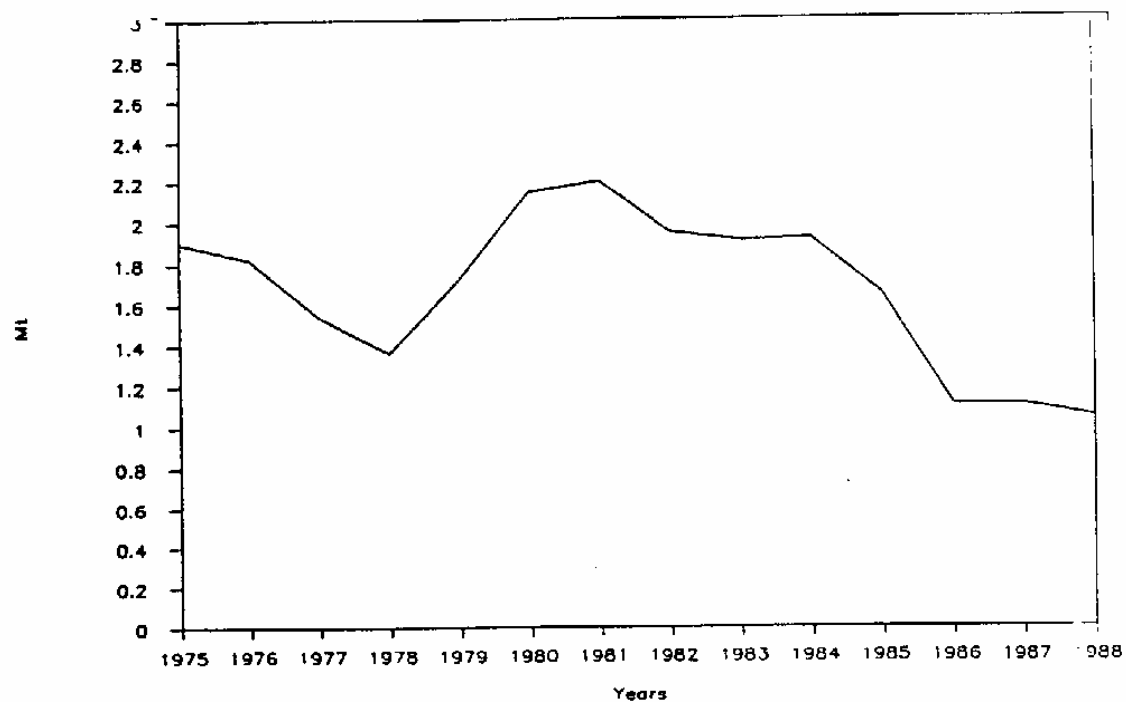


Figure 8A.23: Australian economic demonstrated resources, manganese ore, 1975-1988

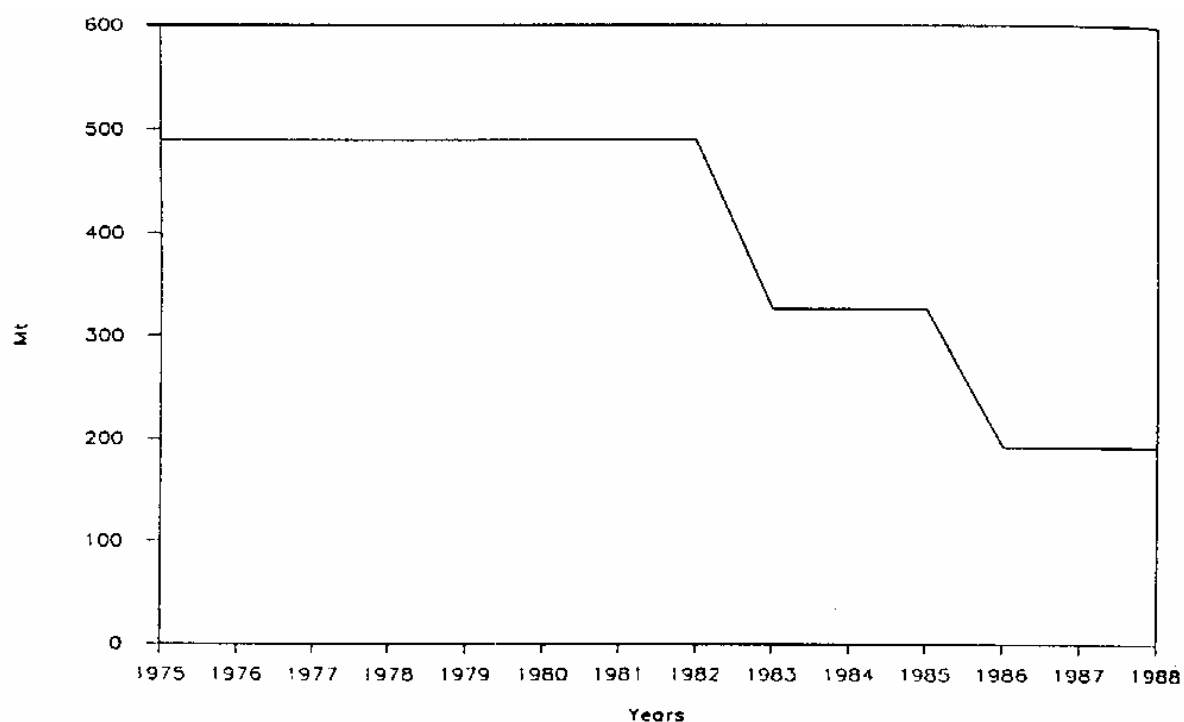


Figure 8A.24: Australian economic demonstrated resources, silver, 1975-1988

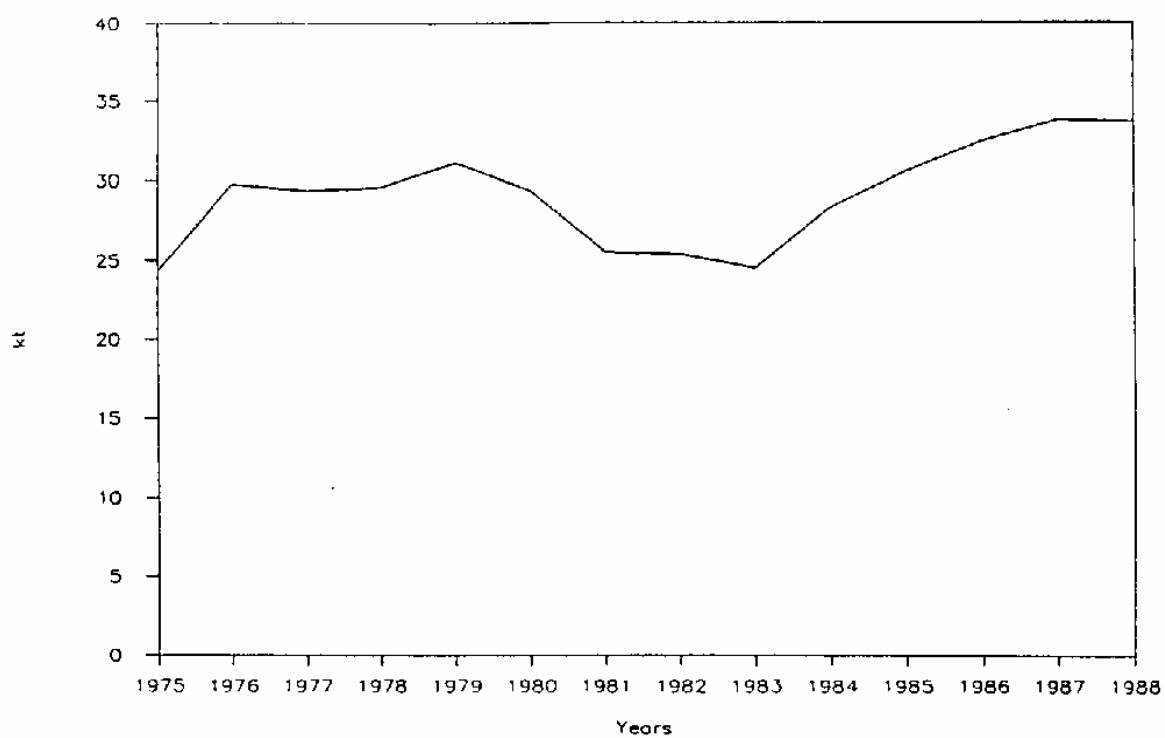


Figure 8A.25: Australian economic demonstrated resources, tin & tungsten 1975-1988

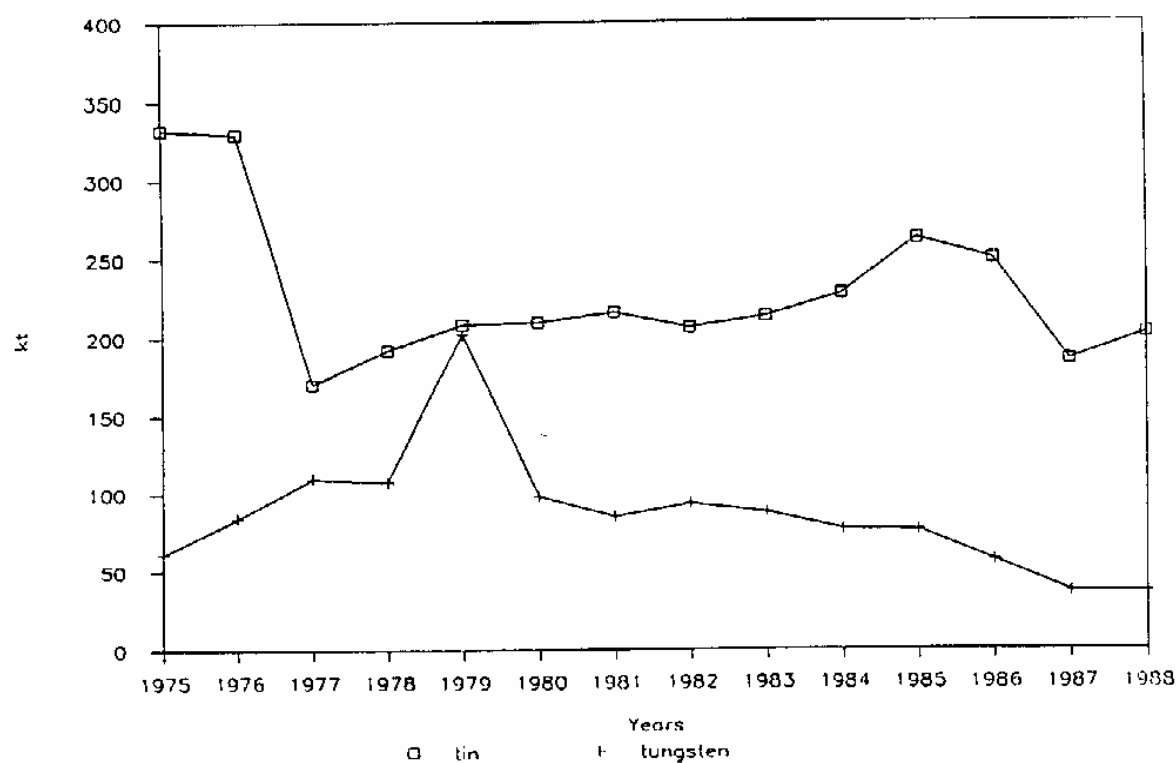
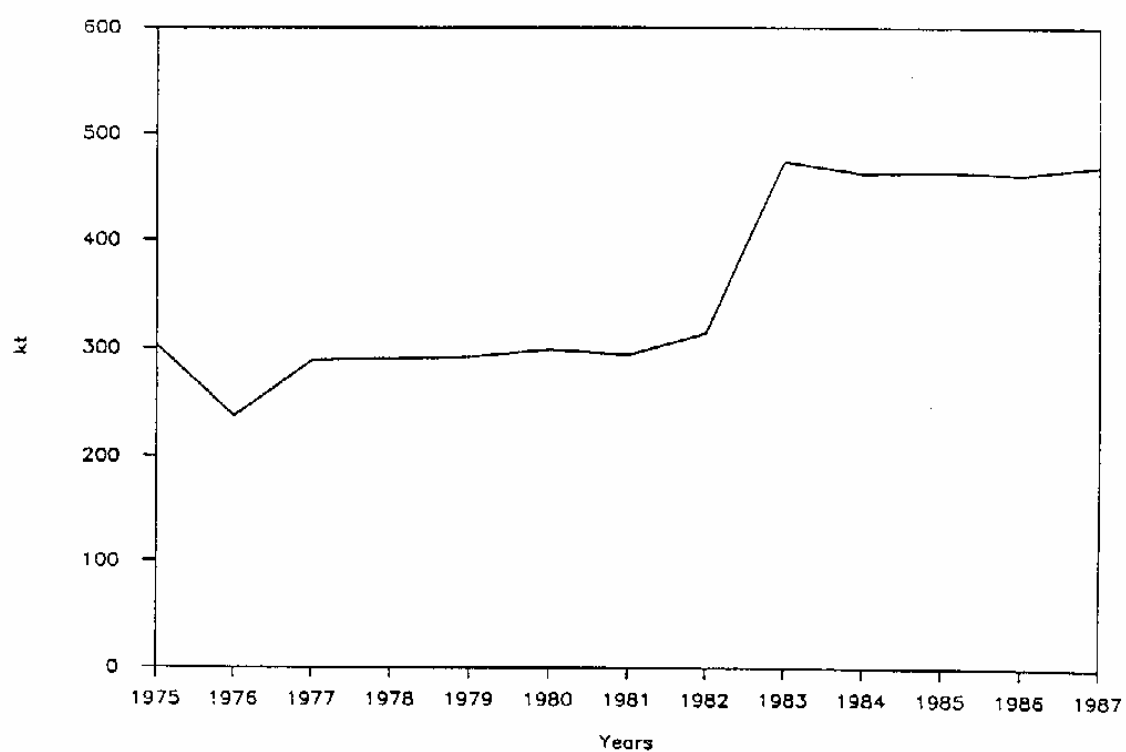


Figure 8A.26: Australian economic demonstrated resources, uranium, 1975-1988



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9 ENVIRONMENTAL IMPACT ASSESSMENT

Environmental impact assessment (EIA) as currently undertaken in Australia has many problems. Questions have been raised about the scope, content and scientific integrity of 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 procedure to become hostage to political expediency. After reviewing problems with current processes and procedures - particularly as they relate to mining and mineral processing developments - this section goes on to consider possible improvements and alternatives.

9.1 Growing world-wide concern about environmental damage

Rapid population growth and advances in science and technology have led to large increases in the scale of production and consumption world wide, and hence the potential for human activities to damage the environment on a local, national and even global scale.

The 1960s and 1970s saw concern for the environment blossom to become a major issue. Fuelling that concern was, in part, past (and in some cases continuing) depredations of the environment by mining and mineral processing activities. World-wide concern over damage - in some cases apparently irreversible - caused by lack of care or foresight in planning many types of development was also heightened by a series of environmental disasters which received widespread publicity. In Australia, those living on the coast would in many cases have experienced firsthand the havoc wrought by sand miners, and the 'moonscape' appearances of places like Queenstown in Tasmania have become famous.

Mining companies have responded to this concern by devoting much more attention and resources to the possible environmental consequences of their activities. Some have become more or less model corporate citizens in this regard - even winning prizes for their efforts at rehabilitation in some cases. Others have not responded as society would have wished, with particular problems emerging when, for example, insolvent companies have simply walked away from projects which have turned into environmental disasters - leaving governments having to foot the bill to make good (or at least contain) the damage.

Governments have also responded to increasing public concern about environmental issues, with the United States enacting its *National Environmental Protection Act* in 1970, and other countries following suit - the Australian Government passed the *Environmental Protection (Impact of Proposals) Act* in 1974.

9.2 What is EIA and what is its purpose?

EIA has been described by James and Boer (1988, p.1) as:

... a mechanism for private enterprise, governments and the general public to cooperate in development planning to make full use of available natural and economic resources. It is the main method of accounting for impacts of development on the environment and of ensuring that adequate environmental protection measures are incorporated in the development process.

EIA is applied mainly to project appraisals. Typically, a public decision is required in which the benefits of development must be compared with adverse impacts on the environment. To protect the environment, appropriate measures must be taken. In extreme cases, this may involve cancellation of the project. More generally, environmental safeguards and proper environmental management procedures must be specified and implemented.

In his second reading speech on the *Environmental Protection (Impact of Proposals)* Bill of 1974, Dr Cass (the then Minister for the Environment and Conservation) stated that:

This Bill seeks to improve consideration of environmental factors in the Government's decision making through use of the environmental impact statement technique and public inquiries. The Government's proposals reflect its belief that, in the past, insufficient attention has been given to environmental considerations when decisions were being taken.

In describing the Environmental Impact Statement (EIS) process prescribed in the Bill, the Minister went on to say:

The statement will be required to set out the need for the proposal, the objective of the proposal, the alternative means of reaching that objective and the environmental effects of these different alternatives. ... Following public scrutiny the impact statement will be finalised and submitted, together with the report of any public inquiry, to my Department for assessment. ... except where specifically exempted by the Minister, public comment will be sought before a statement is finalised and before any decision is taken on the proposal concerned. ... The public will be given a real opportunity to influence decisions. ... we will ensure Cabinet considers the economic, technological and environmental consequences of proposals at the same time, before any decision is taken. ... Environmental considerations will become an integral part of the information upon which a decision is taken.

By 1978, most State Governments had also passed environmental legislation.

9.3 Problems with Australian EIA

Much criticism has been levelled at environmental impact assessment as it is practiced in Australia.

Concerns about the scope and content of EIA

EIA, as currently practised, does not usually provide the information necessary to make a rational decision on which land use (or sequence of land uses) will maximise the benefit to society.¹ Not only could an EIA (but more appropriately a cost benefit analysis) estimate the likely environmental impacts of the project, it should also contain estimates of all relevant costs and benefits to society. Further, it is highly desirable to convert all costs and benefits to a common denominator, such as dollar values, to facilitate comparisons of alternatives.

Nahan (1986, p.28) has commented on this aspect as follows:

It [EIA] does not provide any guide to conclusions on more difficult issues. As a result, decision-makers are left to act without any worthwhile indication of people's preferences on alternative courses of action, except what may be offered through political channels. The ensuing decision may be an imposition of the decision-maker's own values, or be a product of chance.

The need for an EIA/EIS often arises when a large-scale project is proposed on land owned by the Crown, particularly if it is proposed to be located in a 'sensitive' area. Once the process has been set in train, the question asked is not so much 'What is the best use of the land involved from the point of view of society?' but rather 'Is this particular use environmentally acceptable?' or 'How can the environmental impacts of this proposal be minimised or contained within acceptable levels?' However, as James and Boer have pointed out (1988, p.6):

To maximise community welfare, the widest possible range of alternatives should be considered. This is not always achieved under the present procedures. EIA is mostly carried out only after a specific proposal has been made. Opportunities for development planning and environmental protection are often tied to the appearance of new projects and programs. The range of options is then necessarily restricted. Typically, the available choices are to accept or reject the proposal, or to incorporate design features or management actions within the proposal that minimise impacts on the environment.

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 aspirations. Quoting a retiring director of the NSW Department of Environment and Planning (Sydney Morning Herald 28/11/87), 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 (EISs) 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.

¹ Society is used here with its broadest meaning and includes the interests of future generations.

The Commission considers that EIA as currently practised in Australia is too narrow a basis upon which to make resource-use decisions. Rather than basing such decisions on a proposal's putative impact on the environment, the Commission believes that public land-use decisions should basically be economic ones arrived at using a cost-benefit framework, leading to acceptance of a proposal (or sequence of proposals) which maximises the net benefit to society. EIA would then provide scientific information as just one (albeit vital) input into the decision-making process.

The Australian Conservation Foundation effectively agreed with such a view, stating (sub. 68, p.15):

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 EIS 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.

The (Commonwealth) Department of the Arts, Sport, the Environment, Tourism and Territories (DASETT, sub. 65, p.3) has proposed incorporation of economic considerations into EIA through extended (or social) cost-benefit analysis (CBA):

Consideration of environmental impact should be an integral part of planning for a project, considered from the earliest stage and throughout the life of the project. Developers should be aware of the incentives and appreciate that environmental factors can be taken into account efficiently in order that progress of the project may proceed smoothly, problems anticipated, environmental costs minimised and environmental gains realised.

Fairweather (1989) has observed that many EISs merely assert that the environmental consequences of a project will conform to some 'arbitrary' guideline (eg in respect of effluent concentrations), but do not in fact predict the consequences (or impact) of such a level. He goes on to say (p.143) that:

Scientists involved in EIA should be aware that they need to be the providers of information, not just data. ... Simplistic descriptive data such as species lists or population estimates are only part of the picture. The decisive part is site-specific information on ecosystemic function and what the putative impacts do to these; and how the impacts affect the opportunities for organisms to recolonise the site of impact.

Responsibility for preparation of an EIS

Responsibility for preparing (and paying for) an EIS rests with the proponent of a project, who usually hires a consultant for the purpose. This raises questions regarding the objectivity of the EIS process, especially if Buckley is correct in claiming (1989, p.146) that:

In most States, EIA is still seen, at least by proponents and planning authorities, simply as a once off hurdle to be surmounted in gaining development approval, rather than as part of an ongoing environmental planning and management process.

Echoing similar misgivings, James and Boer (1988, p.1) believe that "One of the greatest limitations of EIA is that the responsibility for the investigation falls on the development proponent."

Fairweather (1989, p.142) believes that there is a general lack of understanding among those preparing EISs of the various ecological processes which take place in the surrounding environment, and that there seems to be little effort to keep up with recent research on the subject:

Much of the EIA literature still resounds with old and outmoded ideas from the ecological literature of the 1970s and earlier. ... The present status of these ideas is at best contentious and at worst discredited. Although these ideas may not in themselves be dangerous, such a tendency to quote them gives little strength to the argument that good (ie up-to-date) science is being put to work for the public interest in EIA.

The Nature Conservation Council of NSW considered (sub. 50, p.7) that:

EISs should be prepared for all exploration, mining and mineral processing proposals in States and Territories as a matter of course. They should be carried out by independent consultants, at the proponent's expense, who are answerable to a national scientific body not the developer. This would ensure a more objective assessment of the environmental impacts of the proposal and hence would increase the chance of environmental protection.

Cumulative effects versus project-by-project assessment

Since EIA is generally conducted on a project-by-project basis, the cumulative effects of several developments in a particular area could result in a suboptimal outcome. The first project in an area often involves relatively modest environmental impacts, but as the cumulative environmental effect of later projects builds, the environmental costs which subsequent projects impose may be cumulative, providing an incentive to get in early.

Limited opportunities for public involvement

Bates (1987 p.92) has proposed that:

If the desire to seek public comment is genuine, and not, as it often is, token, then the EIS must be arranged and written in a reasonably intelligible form and style. Many, if not most, EISs are unnecessarily long-winded and repetitive, and often seek to dazzle the reader with science in order to discourage any adverse 'uninformed' public comment. Technical detail is, of course, necessary for the proper evaluation of most projects; but there would seem to be no reason why the technical details could not be better explained; or, failing that, why a shorter, more concise statement could not be issued for public comment, with technical and scientific data included as a separate document or appendix.

The public generally do not have access to environmental monitoring data so that informed judgments can be formed of predictions made in an EIS. To some extent, this prevents public accountability of the process. The Australian Mining Industry Council (AMIC), however, claimed that the public would not be in a position to understand relevant detailed data, and that companies are not keen to release information that they regard as capable of misinterpretation or misrepresentation, fearing conservationists would use any information provided in anti-development propaganda campaigns.

The (NSW) Chamber of Mines, Metals and Extractive Industries argued (sub. 37, p.7) 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. This attitude engenders an entirely negative public focus that fails to involve the public at a much earlier stage in the process before the preparation of an environmental impact statement in order to allow the proponent an opportunity to address real and perceived environmental issues before an EIS is placed on public display.

The Chamber believes that judicial review of a development decision should be the last resort, but "it is becoming increasingly evident that it is the only recourse." The Chamber further claimed (sub. 37, p.7) that:

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 interests of the directly affected members of the general public ... have been replaced by those with other agendas. The system designed to protect the public is now abused.

Poor monitoring and operational feedback

There appears to be too little follow-up during the life of a project to check on predictions made in the EIS and the effectiveness of measures taken to minimise environmental damage. A special committee of the US National Research Council recently stated that testing the accuracy of the predictions was the single action that could most improve EIA in that country.

Buckley (1989, p.147) summarises some interesting results from his detailed 'environmental audit' of 1989: Of some 1 000 formal Australian EIA documents, only 19 major projects contained detailed environmental predictions and supporting environmental monitoring data adequate to test them. Buckley tested some 200 major predictions and some 175 subsidiary predictions. Selecting only the most critical prediction for each development project in each main impact category - such as air quality, water quality, projected impact on flora and fauna etc - he came down to 68 quantified predictions of approximately equal significance. Of these 68 cases, the actual impact proved as or less severe than predicted for 39 (57 per cent) and more severe for 29 (43 per cent).

Where the actual impact exceeds the predicted impact, the community may not be being adequately compensated by the proponent for the environmental costs of the project. On the other hand, in cases where the actual impact is less than the predicted impact, the cost of complying with environmental safeguards may be unnecessarily high. Both situations are suboptimal. There may therefore be benefits to society by better monitoring of operations, which should also allow more accurate impact predictions to be made in the future.

However, the cost of public monitoring of all development projects is likely to outweigh the benefits. Self-monitoring of projects is a feasible alternative. This principle is used in the income tax system for much the same reason. Proponents could examine and record the impacts of their development and be subject to random spot-checks by a Government agency to ensure their integrity.

Since no one organisation is responsible for preparing or co-ordinating EIA research, there is little consolidation of relevant data. As a consequence, most project proponents have to start virtually from scratch, instead of benefiting from the experiences, and mistakes, of previous projects.

Another result of poor monitoring during the life of a project is that there is little incentive for developers to stay within the requirements of their EIS. A number of submissions criticised a 'common' attitude amongst prospective miners of treating EIA as a once-off hurdle to be ignored once overcome.

Accountability problems

Government regulatory authorities responsible for evaluating EIA are not directly accountable to the public - thereby raising the spectre in the eyes of some of possible bias or negligence becoming a problem. Buckley (1990, p.16) believes that:

The more the public demands greater accountability from government agencies, and the more weight the electorate places on good resource management decisions by politicians, the greater the commercial incentive for better environmental management by the proponents of development projects, and the better the science in EIA.

Buckley also notes (1989, p.146) that "there are generally no practical mechanisms for regulatory agencies to enforce environmental protection commitments." Bates (1987, p.85) makes a similar claim to the effect that:

Enforcement of the EIA process has not been a feature of the Australian approach to EIA because State systems, like the Commonwealth, are generally designed to avoid judicial scrutiny of the application of EIA to individual projects. This is achieved by drafting legislation which leaves wide discretions to Ministers, assessing authorities and decision-makers as to what projects should require EIA; and by incorporating procedures into administrative guidelines which are not legally enforceable.

With respect to procedures, unless they are laid down by legislation, or by regulations passed under authority of legislation they are not likely to be legally binding and enforceable. Thus, procedures contained in administrative guidelines and the like, which are used by the assessment authorities to regularise the scope and content of EIA, are not legally enforceable. Even the Commonwealth procedures, which appear *prima facie* to have the force of law, are of doubtful legal status because they have not been written into the Commonwealth Impact Act nor enacted by regulation.

Bates (1987, p.69) believes the difficulty Australian EIA regulating authorities have in enforcing their recommendations reflects an attempt to avoid the enormous judicial delays experienced in EIA in the US:

The American experience with regard to environmental impact assessment under the *National Environmental Policy Act 1969* was that the mandatory provisions of that Act opened the way to many hundreds of court challenges, based on some procedural or substantive irregularity in the decision-making process. The necessity to make environmental impact statements as 'judge-proof' as possible thus led to inevitable delays in the preparation and review of such statements and the expenditure or loss of large sums of money consequent upon such preparations and delays. Accordingly, when the Commonwealth government decided to introduce its own impact assessment Act, Dr Cass remarked in his second reading speech that the Commonwealth hoped to avoid these difficulties by making the necessity to prepare an impact statement discretionary rather than mandatory, and by incorporating the requirement to consider the possible environmental impact of a proposed development into the normal processes of government decision-making. In this way, environmental decision-making could be retained as part of the administrative function, immune from the threat of judicial review; while proposed projects would be safe from the crippling delay and expense often encountered in America. The Impact Act itself therefore is very little more than a statement of the government's policy on environmental impact assessment.

The Total Environment Centre disagreed with this policy, claiming (sub. 10, p.5) that:

The public should be able to undertake legal actions in the public interest to ensure enforcement of worker health and environmental requirements of a development. Where an EIS describes environmental and worker protection measures, which are subsequently prescribed as conditions of a developments, the public should have the automatic right to legal and professional assistance to enforce these measures in the courts.

Political expediency

Another potential consequence of the ministerial discretion permitted under the *Environmental Protection (Impact of Proposals) Act 1974* is that the EIA process, and particularly the decision-making area, is open to political expediency. In this respect AMIC commented (sub. 29, p.44) that:

When the Act was introduced in 1974 most of the States did not have equivalent legislation. The Commonwealth legislation was therefore seen as filling a vacuum. However, all the States now have environmental assessment legislation or appropriate arrangements and the Commonwealth has agreements in place with all States on the joint assessment of development proposals to which Commonwealth powers may apply. In theory, this avoids duplication and delay and provides a rational assessment process. In practice, the opportunity for politically expedient decision making at the Commonwealth level remains undiminished.

CRA proposed (sub. 73, p.108) that:

Before a mining venture can begin, any new project must undergo a rigorous environmental assessment process. An EIS must be prepared based on guidelines developed by the appropriate State and Federal agencies. ... However, there needs to be greater predictability in the procedures. There have been cases where EIS documents have been prepared in response to Government guidelines, only to be judged inadequate due to changes in the guidelines.

This in fact happened to the Coronation Hill project.² The Coronation Hill Joint Venture (CHJV) prepared an EIS following guidelines prescribed by the Commonwealth Government. While the Government accepted that the EIS met the environmental guidelines it had set, it nevertheless decided to conduct an inquiry into the cumulative effects of possible future developments in the Coronation Hill area before deciding if Coronation Hill itself could proceed. The resulting delay has cost the CHJV a considerable amount and has reduced the mining industry's confidence in Commonwealth Government processes. AMIC commented (sub. 29, p.44) that:

The recent decision on the Coronation Hill project and to exclude mineral exploration from 98 per cent of the previous Kakadu Conservation Zone is an example of how a clearly defined environment approval process can be thwarted by political expediency. ... Coronation Hill showed that, even where the environmental assessment process is allowed to be implemented, it is possible for governments to override scientific and economic fact if it judges it politically expedient to do so.

Time frame for EIA can be too short

The time period used by proponents for environmental research to be incorporated into an EIS rarely exceeds one year. Such a relatively short period makes it difficult to allow for seasonal variations and trends to be understood and properly incorporated into predictions of likely environmental effects. On the other hand, pressures to restrict the time taken to prepare and submit EISs are the outcome of other processes. For example, the exploration, engineering and feasibility studies for a project are generally carried out for significant periods before any environmental impacts are considered. This state of affairs seems to reflect the fact that developers

² For a detailed discussion of the Coronation Hill issue see Section 21.

seem to want to know if the project is viable on economic grounds before even considering outlays to address environmental concerns. However, once convinced of the viability of a project, it is in the interests of the proponent to minimise any further delays in getting the project up and running because of the costs that have already been expended in relation to prospective revenues. Thus financial pressures on project proponents dictate that the time expended in obtaining required approvals (including conforming to environmental requirements) be minimised.

A good example concerns the proposal to put a tombolo [a bank or deposit of sand connecting an island to the mainland] in Port Hacking, NSW: the engineering aspects of the project were under study for 3 years, before 2 months of excellent biological assessment was undertaken...

The resulting reports of such brief studies must necessarily present a static view of the habitat and its ecological communities of animals, plants and microbes. Yet ecology is not a static science: it is concerned with the very processes of life. (Fairweather 1989, p.141)

9.4 Alternatives to the EIA/EIS process

The environmental impact analysis/economic cost-benefit analysis route is a potentially expensive path to go down if only because gathering information is not costless and the resulting decision-making process is likely to involve long delays (not to mention having the potential to create entirely new arms of the bureaucracy). There is much to be said, for example, for allowing project proponents to proceed with minimal public evaluation of their proposals, but in the full knowledge that if they transgress as far as the environment is concerned, they will be held liable for their sins. As discussed in Section 7 on mining and the environment, restitution for damages could be effected in any number of ways (eg via the courts, by invoking the polluter pays principle or by insisting on up-front 'performance' bonds to cover possible damage). Such alternative approaches may well prove more cost/effective than trying to make EIA/CBA approaches work properly.

9.5 Conclusions

The Commission is far from convinced that 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 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 be possibly taken to lessen or minimise the likelihood of environmental damage; and

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- what measures the proponent 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, 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 EIA 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 DASETT (or its equivalent State/Territory body).

The proponent should 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 environmental impact statement, before providing its own advice to government on the adequacy of both the statement 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 governments 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 time 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 (eg 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.

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).

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PART II

GOVERNMENT REGULATION

GOVERNMENT REGULATION

There is no single level of government in Australia (federal, state or local) which has complete control over mineral resource development in this country. The Australian constitution allocates jurisdiction between the Commonwealth and the States on the basis of reserving specific powers to the Commonwealth, while the exercise of residual powers falls to the States (with Commonwealth law prevailing where inconsistencies arise).

The Commonwealth Government has no direct powers in relation to resource development, except offshore and in respect of certain minerals (principally uranium) in the Northern Territory. Nevertheless, the Commonwealth is able to influence overall mineral development (and in some cases individual developments) by virtue of its powers in respect of areas such as international trade, customs and excise, taxation, people of any race, and loan raisings.

Since the mineral industry depends heavily on export trade, the capacity of the Commonwealth to control exports through its trade and commerce powers has a significant impact on the industry. Section 10 outlines and discusses different forms of Commonwealth Government intervention in mineral trade. Section 11 discusses the Commonwealth's power in relation to foreign investment regulation. Commonwealth government control in the areas of transport and taxation are discussed elsewhere in this report.

Ownership of most mineral resources is vested in the States/Territories, giving them primary control over mineral developments (except where overridden by commonwealth law). Local governments are also entrusted with varying levels of power in relation to resource development, although these powers can also be overridden (by State Governments) Section 12 of this Part outlines and analyses State regulations directly affecting the mining industry and the interactions between mining and other legislation.

This Part of the report illustrates the many problems associated with regulation of mining and mineral processing activities by all levels of government, and how regulatory friction can occur as each level of government pursues its own goals independently of what other Australian government are trying to achieve. Also frequent and sometimes *ad hoc* regulatory changes create an operating environment for the mining and minerals processing industries which exacerbates what is already mish-mash of regulations which impose substantial costs, delays, and uncertainty on resource-related activities, which rarely achieving their apparent objectives, or only doing so at enormous costs.

10 Commonwealth intervention in mineral trade

Given the predominantly export orientation of the markets for many of Australia's minerals, Commonwealth Government intervention in mineral trade has the potential to influence significantly the competitiveness and efficient development of mining and mineral processing activities. Interventions by government in mineral trade include export controls, export duties, marketing authorities, export assistance schemes, international trading agreements, and import restrictions imposed by other countries. Such interventions represent attempts to secure some 'market advantage' or to serve other objectives of government. This section examines the case for Commonwealth Government intervention in mineral trade and finds little evidence to suggest that existing measures benefit the nation.

10.1 Introduction

This section reviews the nature of the (mainly international) markets for Australian mining and mineral products and examines the case for Commonwealth Government regulation and intervention in those markets in the case of certain minerals (eg bauxite/alumina, coal, uranium and copper). Certain aspects of mineral markets (eg climatic influences on energy demand) are beyond the control of governments. However, others factors are amenable to government influence, including such things as export controls, export duties, statutory marketing arrangements, export assistance schemes, international trading agreements, and import restrictions imposed by other countries.

10.2 Main features of the markets for Australian mining and mineral products

Export orientation

Australia's relatively small population (and thus 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. According to McTaggart (1990, p.4) over 80 per cent of total Australian mine output is destined for export.

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 the Australian mining sector depends 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.

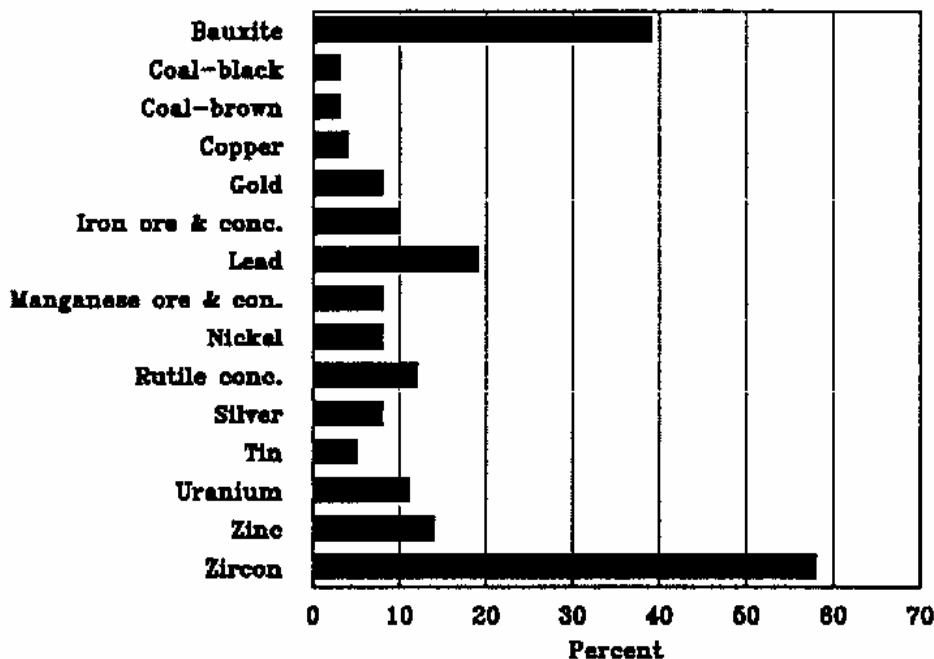
The export orientation of the Australian mining sector also means that the \$A exchange rate against other major currencies is a very important determinant of competitiveness.

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 increase our revenue, Australian producers would have to act in concert to restrict supplies such that, the resulting (scarcity-induced) price increases outweigh the reduction in volume effect. Over the longer term the 'killing' would have to be sufficient to compensate for the loss in purchase power of any future price gains compared to present day values. Except in the short term, there is likely to be substitute suppliers of the same mineral and substitute products (eg plastics for metals).

Since Australia generally accounts for less than 15 per cent of world production of any one mineral (See Figure 10.1), there is little evidence that we may exert market power.¹

Figure 10.1 Australian Mineral Production as a Percentage of Estimated World Production, 1988



Source: Australian Mineral Industry Quarterly, various issues.

Contract versus spot market sales

The volatility of mineral commodity prices over the short run has already been remarked upon. Such 'spot market' prices fluctuate with unpredictable shocks to supply (eg strikes) and demand (eg the situation in which a large supplier needed additional supplies). Rather than rely totally on spot

¹ Some argue that Australia could potentially exert market power in 'niche' areas where our dominance looks much more impressive - but this argument must run increasingly foul of the substitutability problem.

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 supplies² in order to avoid inefficiencies such as temporary shutdown or having to adapt production processes to new sources of (quality) 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. Spot markets therefore reflect short term influences on supply and demand, with prices acting to achieve a balance.

10.3 export controls

The Australian Constitution grants the Commonwealth Government power over international trade. This gives the Commonwealth the power to intervene in the commercial negotiations of mineral exporting companies if it perceives such intervention as being in the "national interest". For example, the Commonwealth Government can impose quantity restrictions or outright embargoes on mineral exports, it can control the destination of exports, and can use export controls to try to influence the price received for mineral exports. Since the Australian mining sector is predominantly export-oriented, these controls have the potential to affect its efficiency and growth significantly. The following discussion details current export controls applying to minerals under reference, the rationales behind their establishment, and their possible effects on the international competitiveness and further development of the mining and minerals processing industries.

Current export controls

Export controls are administered primarily under Section 112 of the *Customs Act (Commonwealth), 1901*. Different forms of export controls have existed since at least 1938 when an export embargo was imposed on iron ore for strategic reasons (Deutscher N.C. 1983, p.64). Since that time a wide range of minerals has been subject to export control. These controls have varied between minerals, depending on the reasons behind government intervention and on prevailing economic conditions. Recent years have seen the termination of several export controls - on tungsten and tin in 1986; on primary forms of copper (but not copper scrap, copper alloy scrap and secondary ingots), lead, manganese, nickel (excluding nickel powder), and zinc in 1988; and on copper scrap in 1990. Also, in 1986-87 greater flexibility was given to bauxite, alumina, and coal producers when negotiating export contracts by removing the requirement for prior government approval of their negotiating proposals (Department of Trade 1986). Current export controls are as follows:

- Alumina, bauxite, coal, and iron ore exporters must obtain export approval on the completion of negotiations;

² In terms of guaranteeing consistency of supply, it can be advantageous for Australian producers to gain accreditation for their outputs on some internationally recognised commodity market (such as the London Metal Exchange).

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- **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 believe would make such exports undesirable.

Arguments for export controls and their merit

Successive Australian Governments have retained export controls over various minerals in an attempt to take advantage of perceived imperfections present in the markets for these commodities. The arguments behind Government intervention essentially rest on the assumption that such intervention can secure better market outcomes. The following discussion presents and assesses a number of reasons often advanced to justify the use of export controls. They can be split into two broad categories: those relating to objectives such as ensuring a fair return on Australia's resources; and those relating to ensuring an adequate supply of Australia's resources for domestic use or preventing development on environmental grounds. They are all said to be 'in the national interest'.

Ensuring a fair return on Australia's resources

The arguments put forward in the name of ensuring a fair return on Australia's resources have included - to ensure that minerals are sold at fair and reasonable prices; the existence of market power by Australian producers; enforcing countervailing power in situations where negotiations are conducted with centralised buyers; and correcting for information deficiencies which may lead to inappropriate market outcomes. Each argument is examined in the following section.

- Fair and reasonable prices

Australian mineral resources found "in the ground" are owned by the State, on behalf of the community as a whole. It is argued that, by using its export control powers, the Commonwealth Government can monitor the settlement of certain contracts to ensure that prices received are fair and reasonable in relation to the market, and that long term contracts include adequate price escalation and review provisions. Thus export controls could be used as a mechanism to ensure that mineral exporters negotiate and agree to reasonable commercial outcomes which are consistent with maximising trade benefits for Australia, or are in the "national interest". However, as pointed out by BHP (sub. 67, p.17) this whole notion invites subjective interpretation of what is in the "national interest".

As an example, in 1990 the Minister for Primary Industries and Energy (1990) opposed the Coalition's proposal to remove export control powers regulating coal. Without export controls Mr

Kerin believed minerals would be sold to the "highest bidder without concern for the disastrous impact of mine closures and the well-being of the wider Australian community in achieving an acceptable return for its natural resources."

In addition, coal mining unions have advocated for some time the introduction of a national coal authority to act as a single body, in the national interest, among coal exporters. The UMFA (sub. 23, p.73) supported this concept and submitted that:

Given the deep rooted nature of the problem of divided interests and the demonstrated propensity of Australian coal companies to ignore industry interests for the sake of individual company interests, a stronger hand is required.

However, the NSW Coal Association submitted (sub. 71, p.14) that:

Australian coal exporters have achieved, on balance, price outcomes which accurately reflect market realities. If the public has concerns about coal prices then they are misplaced and are heightened rather than mollified by the aura of "specialness" which the presence of export controls casts on the industry.

(The proposal for a National Coal Authority is discussed in detail in Section 22: The Coal Industry.)

Several other participants commented that private companies generally have vested interests in receiving the best prices, or the highest return possible, and consequently their decisions will be aimed at achieving the most profitable outcome to the benefit of Australia. For example, in its submission Alcoa stated (sub. 16, p.21):

Alcoa as a business naturally wants to maximise revenue and so will sell at the best prices it can get for its products. This desire for the best prices in turn maximises the returns to the economy.

It has been argued that export controls allow the Commonwealth Government to closely 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. Consequently, any profits made by the company show up in their overseas affiliates accounts and are not subject to Australian tax collection. As an example, The Central Land Council submitted that "there is continuing concern that Australia may not be maximising the value of its mineral exports due to practices such as transfer pricing and excessive price competition between Australian exporters." (sub. 193, p.14) In addition the Minister for Primary Industries and Energy stated that foreign investment was welcome in Australia as long as it is entirely consistent with the national interest. The "close monitoring of export control powers are, in a sense, a necessary corollary safeguarding our liberal foreign investment regime." (1989a, p.81)

A number of participants such as Alcoa (sub. 16, p.22), ACA (sub. 71, p.12), and CRA (sub. 73, p.98) argued that this concern was unfounded and export controls are an inappropriate response to such a concern. Whilst it was recognized by various participants (eg Alcoa, sub. 16, p.22) that the Government has an interest in assuring 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 Taxation

Office.³ (More detail on transfer pricing and foreign ownership in the mining industry is provided in Section 11, Foreign Investment Regulation.)

The need to incorporate price review provision in the approval process of long term contracts was also questioned as a reason for exercising export controls. For example, Shell stated in its submission that no exporter would wish to conclude a contract without review provision, although Shell proposed that "the commercial risk of their frequency and extent should rest with the supplier, not the government" (sub. 66, p.16).

Thus, Government intervention in mineral trade to secure 'fair and reasonable prices' for the "national interest", would only seem justified if there is good reason to believe that there is a divergence between the interests of private companies and those of the nation (ie if companies do not consider the external benefits and costs imposed on the Australian community). In most cases, however, more direct intervention would be a effective means of doing this, for example the taxation system to control transfer pricing.

- Market power

The possible existence of market power has been seen as another reason behind the imposition of export controls. Under certain circumstances (eg in the absence of foreign retaliation), export controls can be used to increase per unit prices on international markets, thus taking advantage of monopoly rents.⁴ For market power to exist however, Australia must control a substantial proportion of the production and trade of a particular mineral, there must be limited substitutes for the mineral available, and significant increases in production must not be likely from alternative sources. In the past export markets for certain minerals were perceived to have these characteristics. However, this situation does not exist today since international mineral markets have, in general, become more competitive. For example, in 1988 Australian production for most minerals accounted for less than fifteen per cent of world production (See Figure 10.1). It is therefore highly unlikely that Australia possesses any market power over individual minerals.

Even if export controls succeed in raising the price received, the necessary reduction in volume to achieve this may result in reduced total revenue. A further risk is that, if overseas buyers purchase from alternative suppliers they may never switch back to Australian suppliers, if Australian export controls are relaxed.

- Excessive bargaining power by purchasers

Distorted buying practices are seen by some to exist between nations such as Australia and Japan and are given as another reason for the imposition of export controls. As an example, when price controls on mineral exports were reapplied in 1978, the then Minister for Trade indicated that the reason for their introduction 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

³ That is, 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 [ACA sub. 71, p.13].

⁴ This analysis is detailed in Appendix 9.2 in IAC 1988, pp.158-9.

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 UMFA contended (sub. 23, p.73) that there would always be 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 in response to supply and demand. Australian producers should be allowed to act competitively in the world market.

- Lack of information

The use of export controls has also been supported on the basis that the mining industry may not have sufficient information about international minerals markets to make well-informed decisions, so that the underlying market conditions are not always accurately reflected in realised prices (Minister for Primary Industries and Energy 1989a, p.81). This misconception by existing companies may give the wrong signals to potential producers and constrain competition in the industry.

Government intervention to correct this case of market 'failure' assumes that the government is more capable of gauging the market than the producers which operate within it. There is no guarantee that price parameters set by government will be the most efficient prices, or will accurately reflect what the market will bear. As an example, CRA submitted (sub. 73, p.126) 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."

The ACA commented (sub. 71, p.17) that, because of the Government's privileged position, it does have "timely access to shortrun market intelligence which is either unavailable to the companies or available only after some delay. Such information, like the latest developments in overseas coal-using industries and the prices of substitute fuels, is valuable background for the companies, particularly around the time when major contract renegotiations take place" (ACA, sub. 71, p.17). As an example, in late 1987 Mr Kerin intervened to reject a series of steam-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 possessed information which indicated that the market had tightened demonstrably (Minister for Primary Industries and Energy 1989a, p.81).

If the Government does possess information concerning the markets for international minerals, then this information possesses the attributes of a public good. The most efficient means of allocating a (pure) public good - because perfect price discrimination is not feasible - is to make it freely available. While information is not necessarily a 'pure' public good - since firms have an incentive to obtain the best marketing knowledge themselves - there are cases where the government may 'comeby' strategic information.

The Commission considers that in such cases the government should disseminate the information freely to the industry as quickly as possible, and then leave it up to the firms' commercial judgement to act on this knowledge.

Notwithstanding this, participants questioned whether such cases would arise. For example Shell suggested (sub. 66, pp.8-9) that markets for both coal and alumina are transparent to participants in those markets, and consequently Australian exporters were not seen to suffer due to any lack of information on the behaviour of these markets. Shell stated that due to the nature of the industry a market mechanism which generates a single published indicator price or clearing price for alumina did not exist, although it argued that an effective information transmission mechanism does exist through the normal interaction of producers, consumers and traders. "Information is also available to industry participants through commercially available market intelligence. In addition, a number of countries, Australia amongst them, publish values and volumes of alumina imports and exports in their trade statistics, from which average unit values can be derived. Such statistics, although they have limitations, can be and are used to reflect the levels and trends of past prices" (Shell, sub. 66, p.13). Shell suggested (sub. 66, p.14) that the barriers to entry present in the alumina industry were a function of the nature of the industry, that is, the dominance of long term contracts as the main form of sales agreement, rather than the lack of market transparency.

The use of export controls for other objectives

Export controls have also been used on occasion to restrict (in part or completely) the development and/or extraction of minerals. This has generally occurred in response to environmental considerations, to conserve specific minerals for domestic consumption or to meet international obligations. These are considered in the following sections.

- Environmental and related considerations

Export controls have been used as a mechanism to control the extraction of certain minerals if a major environmental problem is seen to exist⁵. If mine development hinges on access to export markets, the Commonwealth Government has the power to make mining unfeasible 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.

⁵ The Commonwealth Government also uses export controls as a mechanism to ensure that the provision of the *Environmental Protection (Impact of Proposals) Act* and the *Australian Heritage Act* are met.

According to the NSW Government (sub. 52, p.4 and p.74):

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.

The Commission acknowledges that the use of export controls is in some situations the only way (because of the division of powers under the constitution) in which the Commonwealth Government can have a say on environmental issues. However, in the Commission's view export controls are an indirect and unsatisfactory way of dealing with environmental issues. The indirect nature of this form of intervention is demonstrated if a project remains viable even after it has been restricted to the domestic market. That is, the environmental problems have not been entirely addressed if operations are not closed down completely. This suggests the need for more direct policy measures - such as "polluter pays" taxes and/or improved environmental regulations - and the need for better Commonwealth/State co-operation to tackle such problems (See Section 6 and Attachment 6A).

In addition, export controls on uranium have been justified to meet Australia's obligations under the Nuclear Non-Proliferation Treaty and to implement Australia's bilateral safeguards agreements. CRA submitted (sub. 73, pp.98-9) that these controls should be used for safeguards only and not interfere with any commercial aspects of uranium marketing. The Commission supports that view - see the more detailed discussion on the regulations governing the uranium industry in Section 23.

- Conservation of minerals for domestic use

In a number of cases the Commonwealth Government has imposed export controls on certain minerals in an attempt to ensure that perceived scarce resources were 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 supply, the Government may impose costs on suppliers of possibly more profitable sales overseas. This would affect the domestic supply of these minerals. At the same time the export embargo would be artificially reducing the costs to the local consumer of the mineral to the detriment of efficient resource allocation.

The possibility that export controls may be used may also affect exploration levels. For example the imposition of an embargo on iron ore from 1938 until 1960 greatly restricted the development of the Australian iron ore industry. After the relaxation of these controls there was an enormous increase in the exploration effort (See Volume 2, Appendix G).

In addition the NSW Government submitted that export controls have been useful in the past to encourage the coal industry to add value to its raw materials. A detailed discussion on the benefits and potential for value adding in Australia is discussed in Volume 1, Chapter 6.

The cost of export controls

The (potential) problems which export controls have been used to address are reasonably identifiable. But some of the costs of export controls are less transparent, as is discussed below.

Export controls distort resource allocation

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 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 Australia 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, as an attempt to "improve [Australia's] trade competitiveness"(Federal Minister for Resources 1987).

Costs are associated with delays in approval

There are delays in meeting the requirements of export controls, which impose costs on exporters since they are disadvantaged when negotiating new contracts, even when proposals are approved, with no offsetting advantage in terms of prices obtained. These inherent delays can mean that Australian companies cannot react to changes in the international market at the same pace as competitors, and this can result in lost sales, especially on the spot market. As an example Alcoa submitted (sub. 138, p.3) that:

In the mid 1980's, Alcoa wanted to sell 100 000 metric tonnes of bagged alumina to China. [Alcoa] asked for urgent approval of a price which was \$5 per metric tonne below the previous price, but still within the market range. The lower price was because [Alcoa] wanted to open a market [they] 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 an additional 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". It observed that delays in obtaining approval can be longer than the time taken to negotiate the export contract.

Export controls create uncertainty

Intervention by Governments can be interpreted as, or lead to, the general politicisation of trade. This concept 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 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, which can result in losses of market share for Australia. According to AMIC, buyers all over the world are "suspicious of the 'national interest' rules governing Australian coal sales" (The Australian, 27 March 1989, p.13). Alcoa commented (Transcript, p.691) at public hearings that customers wanting to buy alumina from Alcoa feel that there is the possibility that supply could be cut off by some unilateral action by the Australian government. Alcoa followed up this claim by submitting (sub. 138, p.2) the following evidence:

In the mid 1980's, Billiton did a contract with Alumax for 100 000 metric tonnes 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, not [Alcoa], because of Australian export controls.

Uncertainty can lead to insufficient levels of investment in exploration and development. As an example, the controls exercised by the Federal Government on the export of uranium render investment in the exploration of uranium mining very high risk relative to investment in other mining industries.

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 1989a, p.80). However, export controls still create uncertainty for the domestic mining sector - and, even if controls are not strictly enforced, the threat of enforcement exists.

Additional costs

It has been proposed that prices given by domestic producers to Government may become known to other competitors. Shell submitted (sub. 66, p.9) that if this occurs these prices become the starting line for negotiation, thus resulting in a final price which is considerably lower.

There are also significant administrative costs associated with setting, monitoring and controlling the export control regulations for both Governments and suppliers. This administrative burden not only increases overhead costs of mining companies but it contributes to a general decline in flexibility, as companies can no longer react quickly to market opportunities since they must fulfil so many requirements first (Collier 1985). The Commission estimates, on the basis of information provided by the Department of Primary Industries and Energy (DPIE), that DPIE spends approximately \$400 000 on wages per annum to administer export controls.

McTaggart (1990, p.48) noted that resources are not only diverted by Governments into administering these controls, but also by firms into "rent seeking and other lobbying activity which tries to alter the current allocation and burden of controls."

Concluding comments on export controls

The debate surrounding export controls is centred on whether the costs of regulating and managing export controls are larger than any benefits from imposing them. When considering the overall effect of controls on the mining sector, all the costs facing suppliers, including the costs of operating the scheme, should be weighed against any economic benefits to the nation. It must be recognised that the costs of export controls on marketing and customer perceptions of the Australian mining industry extend beyond the occasions on which the Minister's power is actually used because of the threat that they may be used.

The arguments for imposing export controls are no longer relevant, and therefore, there is little benefit but significant cost in maintaining them. The Commission recommends that the Government remove all remaining export controls on mineral commodities, except those in relation to the Nuclear Non-Proliferation Treaty and Australia's bilateral safeguard agreements.

10.4 Export duties

The Commonwealth has the Constitutional power to levy duties on exports. Two products under reference (high quality coking coal and uranium concentrate) are currently subject to export duties. The following discussion describes the coal export duty and analyses its effects. The uranium export duty is also discussed, although a more detailed description and analysis is found in Section 24: Office of the Supervising Scientist.

Coal

The Commonwealth received \$57m from the coal export duty in 1989/90 and the estimate for 1990/91 is \$49m (Australian Department of Treasury 1990, p.4.29). This duty is levied under the Customs Tariff (Coal Export Duty) Act 1975 and is payable on export coal with the value of duty varying according to the quality of the coal. The initial rates of the duty were \$6.00 per tonne on high quality coking coal and \$2.00 per tonne on other coals (Joint Committee of Public Accounts 1982, p.2). The duty payable has undergone a number of changes (almost annually up until 1982) in the rates and coverage. Since August 1977 it has been \$A3.50 per tonne and presently applies to

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 only applies to six mines all owned by BHP-Utah Coal Limited on behalf of the Central Queensland Coal Associates and Gregory Joint Ventures: Peak Downs, Saraji, Norwich Park, Blackwater, Goonyella, and Gregory (BHP, sub.67, p.9).

Rationale for duty

The stated rationale for the duty 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, p.61). 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. These coals attract a price premium relative to steaming coal, which is exempt from export duty' (BHP, sub. 67, Attach. 1, p.3).

AMIC commented (sub. 29, p.92) that:

... such a tax does not correspond to the ownership of the resource, given that onshore mineral rights are vested in state governments, and therefore it cannot be justified in terms of obtaining a return to ownership of resources.

Similarly, the Queensland Government submitted (sub. 55, p.29) that State royalties rather than Commonwealth imposts are the appropriate mechanism for extracting a return to the community from the exploitation of onshore mineral and energy resources. It maintained that it is the prerogative of the State government to determine the appropriate level of community return.

In addition, the NSW Government submitted (sub. 162, p.27) that the Commonwealth has the corporate tax mechanism which it can use to extract a proportion of any "excess" profits derived from utilisation of resources.

The Australian economy could benefit from an export duty if Australia possessed market power on the international coal market since prices could be varied to take account of the duty without losing market share. However, the opportunities for monopolistic behaviour by Australian coal producers is restricted because of the following factors:

- there have been a number of new entrants into the steaming coal trade such as China, Columbia, Indonesia and Venezuela (these countries could account for 30% of the market by 1995 (Barnett 1989));
- the existence of established suppliers such as Canada, the United States of America, South Africa and the USSR; and
- the shift towards short term contracts, which "at the very least, ... is a signal of the increasing robustness of the market generally and indicative of the overall level of competitiveness" (McTaggart 1990, p.44).

Thus Australia is primarily a price taker in international markets for coal. Even though Australia may possess some degree of short run market power (particularly as a result of locational advantages in the Pacific market), both long term demand and supply are likely to be highly price responsive (AMIC, sub. 29, p.92). In international markets producers cannot increase prices to take account of an export duty and therefore risk market share, which may result in a reduction of volume sold.

Export duties are an indirect method of compensating the Australian community for the use of its coal reserves. The Commission considers that the States royalty systems are a more appropriate mechanism for compensating the community. However, the existence of the coal export duty suggests that the Australian royalty system is inefficient. A further discussion on the deficiencies of the Australian royalty system is covered in Part iv, Section 14.

Is the duty equitable?

The coal export duty is seen by some (BHP sub. 67, Appendix 1, p.3) as breaching the principle of horizontal equity (ie the principle that otherwise equal tax paying entities are entitled to equal tax treatment) because of its extremely selective nature in respect of coal relative to other industries, and at an industry level, in respect of a group of mines relative to other Australian coal producers. BHP-Utah Coal Limited submitted (BHP sub. 67, Appendix 1, p.2) that this duty "has become the most discriminatory tax imposed in Australia", since it now only applies to the six mines listed previously. BHP believed the imposition of the tax "clearly contravenes" the Commonwealth Government's aim of providing a level playing field for industry. In addition the selective nature of this tax was put forward by the NSW Government (sub. 162, p.27) as a factor leading to a distorted allocation of resources.

The UMFA argued (sub. 23, p.23) that the duty was uniformly applied according to coal qualities and mine parameters. The duty was not seen to be company specific or regionally specific.

The selective nature of the export duty on coal has allowed the Commonwealth Government to impose the duty on the export mines which it believes can bear the burden of the tax.

What are the effects of the duty on efficiency?

Changed circumstances since 1975 have meant that the tax has distorted production decisions. For example BHP-Utah submitted (sub. 67, 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.(sub. 67, p.5)

The UMFA assessment (sub. 23, p.23) is that:

... the duty does not undermine the viability of any operation since it is not being applied to newly established mines with cash flow difficulties. [Instead, they proposed that this duty

was] a tax on economic rent which appropriates some of the above average earnings that companies can make by virtue of the high efficiency lease held.⁶ [UMFA stated that] a more sophisticated system of this tax may be of use, but simple abolition is not necessarily required unless the Commonwealth and states wish to actively subsidise producers of high quality coking coal.

In addition, BHP-Utah Coal Limited submitted (sub. 67, p.5) that the coal export duty did not possess another desired characteristic of a taxation system, that is neutrality. The duty was seen to influence producers' decisions in relation to undertaking one economic activity in preference to another, because of the differences in tax incidence between the two alternatives; and it was seen to affect decisions on consumption, production and trade. Also, it induced operational, administrative and allocation inefficiencies; which could therefore threaten the viability of certain mines, plus inhibiting investment, employment and export growth. AMIC stated (sub. 29, p.92) that these undesirable efficiency properties of the duty appeared to be a penalty on risk-taking investment decisions made from the late 1960s through to the mid 1970s. In addition the NSW Government submitted (sub. 162, p.27) that the duty is a cost burden on the industry which is likely to reduce its international competitiveness.

Various participants stated (eg ACA, sub. 71, p.38 & BHP sub. 67, Appendix 1, p.13) that the net revenue yield for the Commonwealth had a trivial budgetary impact, and the benefits of the duty were not commensurable to the costs imposed on the coal industry and the Australian economy. The duty was seen as a mechanism for taxing super-profits should they emerge in the future, and the actual threat of the continued existence of this 'super-tax' during upturns in the economic cycle was seen by BHP (sub. 67, p.10) to be a factor which could discourage major mining investment. In addition the mere existence of the tax may discourage investment in other industries, since investors can become suspicious that governments will impose a 'super-tax' on any venture that is making windfall gains.

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 in 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 (eg rendering uneconomic coal reserves which would otherwise be mined).

Concluding comment

The debate surrounding the coal export duty centres on whether it is considered to be 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). Evidence suggests that the current duty is altering production decisions in the coal industry, thus affecting the allocation of resources. 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. Consequently, the Commission recommends that the duty be abolished. At the same time, it would be necessary to ensure that changes in economic rents are reflected automatically in the State royalty systems. For a more detailed discussion on how this might be done, see Section 14 on Royalties.

⁶ That is the duty is a tax applied to mines with extraordinary financial advantage as a result of the high quality of premium coking coal, the easy geological conditions of extractions and the lower burden of capital costs owing to the relatively maturity of these mines.(sub. 23, p.14)

Uranium

The *Customs Tariff (Uranium Concentrate Export Duty) Act 1980* imposes a duty on Alligator Rivers Region uranium concentrate exported from Australia. The rate of duty from July 1989 has been \$1.30 per kilogram.

The duty was introduced in recognition of the special costs to the Commonwealth of environmental monitoring and research activities related to 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).

ERA (sub. 57, pp.24-5) objected to the levy because it considered it was discriminatory, it represents a significant proportion of ERA's production costs, and it is an unfair burden to be placed on a company required to compete in international markets. In addition ERA believed it was effectively paying twice: once through the levy, but secondly since it has to conduct its own research to address environmental concerns associated with its operations (sub. 57, pp.28-9).

In contrast, the Australian National Parks and Wildlife Service submitted (sub. 248, p.4) that "the charges that are levied on the Ranger Uranium Mine are specifically for the costs of protecting the Alligator Rivers Region from the effects of mining." Thus it believed "there can be no justification for extending charges for that purpose to those who are not involved in mining."

Concluding comment

When assessing the overall effect of the export duty on uranium, it is important to consider whether the uranium industry is paying the appropriate costs of environmental protection. If it is not, the industry is effectively being subsidised and the duty would be a legitimate cost for the producer to pay. Alternatively, if the operating costs of the OSS are excessive (eg if it is operating in an inefficient manner because of its monopoly status), the export duty may be a tax on the uranium producer. The Commission considers that the mining companies in the Region are being discriminated against since they contribute, through the levy, a large proportion of the costs of environmental management, unlike other potential sources of pollution in the Region. (For a more detailed discussion on the uranium export duty and the OSS see Section 24.)

10.5 Marketing authorities

The Commission is aware of three statutory authorities which provide marketing assistance (among other functions) to the mining industry. These are the Joint Coal Board, the Queensland Coal Board, and the Australian Coal Marketing and Technology Council. These, plus the proposal for a national coal authority are discussed in detail in Section 22.

10.6 Export assistance schemes

The following material outlines the different types of general export assistance schemes available to the mining industry in Australia along with all other exporting industries.

Australian Trade Commission (AUSTRADE)

The mineral industry, like other Australian exporters, is eligible for a range of specialised services offered through AUSTRADE. These include:

- Export Market Development Grants Scheme - this scheme provides taxable cash grants for eligible expenditure on certain specified export promotional activities. (eg market research and development). In 1988/89 the government provided 1.7 million in mining sector grants.
- AUSTRADE - Export Finance and Insurance Corporation - is Australia's official export credit agency. In 1989/90 the value of exports covered by AUSTRADE-EFIC against risks of non-payment were \$35.5 million for crude minerals and fertilisers, \$112.5 million for metalliferous ores and metal scrap, and \$161.5 million for mineral fuels and lubricants (including coal).
- Development Import Finance Facility - is a source of export subsidies, whereby concessional finance packages are produced by combining elements of grant aid with normal EFIC export insurance.

The Queensland Government submitted (sub. 55, p.31) that the Commonwealth Government had a premier role in the promotion of exports, and supported the efforts of the Department of Foreign Affairs and Trade and the Australian Trade Commission.

AMIC submitted that the mining industry was one of the lesser users of AUSTRADE, and believed the payment for AUSTRADE's services should be based entirely on a user-pays basis. AMIC stated that it was illogical that AUSTRADE was linked to a specific portfolio which does not have the broad interest of enhancing Australia's trading overseas. AUSTRADE was seen by AMIC to be an expensive organisation for the Australian taxpayer to continue to support, and its services were seen to be duplicative and an inefficient use of resources. Thus, AMIC recommended the transferral of AUSTRADE to Foreign Affairs and Trade and the undertaking of an independent efficiency review (Transcript, pp.59-60).

State Government initiatives

State governments also provide some assistance, although this varies from state to state. For example, the Western Australian Government offers a variety of export assistance including assistance to attend international trade exhibitions, assistance for buyer visits, assistance for the expansion of markets, support for the employment of consultants, and market research services. The Victorian Government provides programs covering assistance with quality improvement, technological development and application, translation services, market familiarisation and market entry.

The New South Wales Government submitted (sub. 52, p.4) that the roles of Commonwealth and State Governments in overseas promotion and marketing of Australian minerals should be enhanced in co-operation with industry. The Northern Territory Government "agreed that direct

involvement in the form of financial export subsidies would represent a distortion in the allocation of resources", although it considered that "the provision of information and market intelligence through government (or authorities) is a legitimate form of facilitating exports and advising industry on market opportunities." (sub. 226, p.8)

Alternatively, Pancon submitted (sub.181, p.4) that during the early days of the Ranger project the Australian Atomic Energy Commission was nominally responsible for marketing product from the project. Pancon stated that this was not beneficial to the project or the nation since:

the market was suspicious, the AAEC was not perceived to be commercially orientated, and decision taking was abnormally long and complicated. The involvement of the AAEC was unfortunate and detrimental. Governments should not become involved in direct day to day market dealings.

Concluding comments on general export incentive schemes

Most of the general export incentive schemes are targeted at smaller organisations, and consequently only have an indirect or limited effect on the mining industry. Even so, the selectivity of assistance through such schemes, plus the fact that most schemes are taxpayer funded (some user pays), inevitably leads to a distortion in the allocation of resources, and can impose costs on the mining industry and the rest of the economy.

10.7 International trading agreements and relations

There are, and have been, in existence specific multilateral, bilateral, and general trade agreements which potentially affect international trade in mineral resources. These are outlined below.

Multilateral agreements

Examples of specific multilateral agreements which Australia has been and is currently involved in 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: promoting the industry (eg encourage consumption, export growth and processing); safeguarding the interests of members and securing returns; providing an intergovernmental forum for the exchange of information (eg statistical information on production and consumption trends); and securing a balance between world production and consumption of the mineral (DPIE 1988, pp.14-24).

Bilateral trade agreements

Market access restraints are not necessarily formal, especially in markets where governments directly or indirectly influence sourcing decisions. For this reason the Government has a role in maintaining cordial trade relations with Australia's major and emerging export markets. In some cases government-to-government talks are often a necessary forerunner to commercial negotiations between supplier and user. Hence the Government currently undertakes various 'door-opening'

initiatives tailored to opportunities in and characteristics of individual markets. Such initiatives include ministerial visits, marketing missions, and general and specialist bilateral forums to examine and develop opportunities (Minister for Primary Industries and Energy 1989b, p.4). ACA believed (sub. 71, p.17) the Commonwealth, through its government-to-government talks, has an important role in mineral markets although it proposed a 'hands-off' approach after the initial contact is made and commercial negotiations begin.

The Department of Primary Industries and Energy is responsible for several specialist consultative forums with other countries, including our principal resource markets and some competitors. These bodies are perceived to promote better understanding of bilateral demand and supply developments. They are an indirect aid to establishing new markets by facilitating the exchange of information and the development of co-operative programs and/or technology exchange. Examples include the High Level Groups on Energy with China, Japan, Korea, and Thailand, the Joint Committee on Mineral Resources Development with Korea, the Working Group on Minerals with Canada, the Australia-European Community Working Party on Raw Materials Processing, and the Australia-Korea Joint Study Group on Raw Materials Processing. Also informal groupings and meetings occur from time to time on specific commodities (Minister for Primary Industries and Energy 1989b, p.4).

General trade agreements

General trade agreements also have the potential to affect the trade of Australia's mineral products. The General Agreement on Tariffs and Trade (GATT) is the main multilateral set of rules governing international trade and has provided a legal and institutional framework for the conduct of trade and international trade negotiations since its inception in 1947. GATT aims to promote a liberal and stable trading environment thus encouraging trade on a non-discriminatory basis, along with supporting global economic development.

The ongoing Uruguay round of GATT multilateral trade negotiations has been examining issues concerning the mining, refining and smelting of minerals. This Round is the current vehicle in which Australia is attempting to achieve greater international market access and reductions in protection in a number of important world markets (AMIC, sub. 29, p.63).

Another general agreement which has been perceived to be relevant to the mining industry is the Common Fund. It originated under the United Nations Conference on Trade and Development, and is an autonomous mechanism designed to help stabilise international commodity trade. Australia was a prominent supporter of the Common Fund Agreement and played a leading role during its negotiation.

The Fund has two principal objectives. The first is to finance commodity buffer stocks of international commodity agreements which become associated with the Fund. The second is to finance commodity support measures to enhance the prospects for particular commodities, through activities such as research and development, marketing, new uses for commodities and breaking down harmful vertical integration. The Fund's resources are provided both by individual commodity agreements and by member governments (CAI 1982, p.7).

The Common Fund Agreement was concluded in 1980 while Australia ratified it in 1981. It was not until July 1988, however, that all the conditions were met to enable the Common Fund to be brought into force. The first meeting of its Governing Council was held in July 1989 (Ministers for Foreign Affairs and Trade, and Primary Industries and Energy 1989).

In February 1989 Australia's contribution to the First Account, set by an agreed formula, was estimated at approximately \$A4.8 million to be paid over three years. Payments to the Second Account are voluntary and in 1980 Australia announced a contribution of A\$5.5 million (Ministers for Foreign Affairs and Trade, and Primary Industries and Energy 1989, p.2).

Since the Fund was negotiated significant changes have occurred in international trade and the commodity environment. As a result the usefulness of the First Account needed to be reassessed in light of changed attitudes towards ICAs with buffer stock. Ministers Kerin and Evans indicated (1989, p.2) that "Australia was ready to work with other countries to make the Common Fund effective and cost efficient and they would be keeping the operation of the Fund under review".

In addition, Ministers Kerin and Evans (1989, p.2) acknowledged the misgivings about the Common Fund within Australia's commodity industries, and stated that the Government would consult with industry representatives on its operations. Indeed, AMIC recommended (sub. 29, p.11) that Australia withdraw from membership of the Common Fund since it believed it would lead to trade distortions (Transcript, p.61).

Economic effects of commodity agreements

Commodity agreements vary considerably between those which are purely a forum for research and development or for information exchange and consultation, and those which attempt to regulate the market through measures such as quantitative export restrictions.

The Commission understands that these 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 IBA), 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.

10.8 Import restrictions in other countries

As a major resource exporter, non-tariff and tariff measures of protection for mineral commodities in other nations, are factors affecting Australia's trade in mineral products. Non-tariff measures have proliferated in recent years as countries have protected their less competitive, or "sensitive" domestic industries, in an attempt to substitute for falling tariff protection. In the words of the Minister for Trade Negotiations "protectionism, wherever and whenever it occurs, acts to depress world prices. It stifles demand and imposes substantial costs on industries and consumers within the protecting country" (Minister for Trade Negotiations 1990, p.6). That is, protectionist measures

act to preserve or expand high cost domestic production in the protecting nations, while more efficient producers face closure or scaling down of production. At the same time the protecting nations impose distortions on their own economies and growing burdens on national budgets and/or users. Development of the Australian mining and minerals processing industries will continue to be frustrated while there is restricted access to international markets as a result of overseas government intervention.

What restrictions exist?

Protectionist measures include direct and indirect subsidies, tariff barriers, non-tariff barriers (Table 10.1 summarises the main non-tariff measures affecting world trade in minerals), import quotas, direct assistance to domestic producers, and price support to domestically produced commodities.

Inquiry participants provided an illustration of barriers impeding their performance in international markets. AMIC submitted (sub. 29, p.63) that market access restrictions existed for a number of commodities, such as coal subsidisation⁷, plus import tariffs against zinc, aluminium and zinc commodities. Tariffs present in Asia and the EC were seen by Alcoa (sub. 16, p.21) to be major barriers. The New South Wales Government stated (sub. 52, p.72) that raw materials are generally granted duty-free access to developed countries, although tariffs and other barriers to trade tend to increase with the degree of processing for many minerals.

A common view held by participants in relation to import restrictions overseas was expressed in the New South Wales Government submission which indicated that it supported the Commonwealth's efforts to reduce barriers to trade in the international market place (sub. 52, p.4).

What effects do these restrictions have?

Various forms of assistance can lead to a misallocation of resources, and an inefficient industry structure in the subsidising nation. These policies can also reduce economic incentives, growth and employment opportunities in other sectors of the economy. As an example AMIC mentioned (sub. 29, p.64) that:

The gains to the FRG economy [of removing subsidisation practices] are also substantial...since if all assistance to the coal industry were removed such that domestic hard coal was entirely displaced by imports, the net gain to the economy would be an improvement to the national income of DM38 billion annually and a boost to total employment of 157 000 ... [Thus the] elimination of coal industry assistance is clearly in West Germany's own best interest irrespective of how pressures for reform from other countries might evolve.

⁷ Coal subsidies in a number of European countries and Japan have been estimated to exceed the total value of world coal trade during 1986 and 1987 (Minister for Trade Negotiations 1990, p.7). It has been estimated that Australia would gain in annual gross export revenue by some \$A2.6b (1987 dollars) in 2000 if these trade barriers were removed (relative to base case projections for that given time), that is a gain of 23% (ABARE 1990).

Box 10.1 outlines the level of coal industry assistance in the former Federal Republic of Germany, and identifies the subsequent costs of this assistance to the German economy and to Australian producers in terms of lost export opportunities.

Also, these forms of protectionism have the effect of penalising efficient low cost mineral producers on the international market, and they interfere with the rational development of new suppliers and growth in trade, while creating additional distortions and uncertainties in the international market for minerals.

For example, in 1989 the Minister for Primary Industries and Energy stated that formal market-access restraints (including tariff and non-tariff barriers) can prove critical impediments to Australia's export marketing success, especially for further processed products. These restraints plus the mineral subsidisation practices of many countries were seen to "contribute to global over-capacity, so they damp prices, contribute to unfair competition in third markets, and diminish prospects for sales to the subsidising country." (1989a, p.82) It has been suggested that Australia should match protection in other countries to allow our export industries to compete on an equal footing. As an example MIM Limited submitted (sub. 19, p.6) that Australia's development in the competitive international market for minerals would be stimulated if Australia:

[matched] the economic environment provided by Australia's competitor countries for their resource-based industries.

The Commission would oppose specific subsidisation policies because of the economic costs imposed on the nation as a whole (eg the case of coal subsidisation in Germany). 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.

In addition, even if Australia were to match these assistance levels, the question is raised as to which country's assistance to match; this could become a very expensive and non-ending process. Also, when a nation engages in protectionism, the credibility of the nation in international trade negotiations, such as the GATT, suffers. This weakens the nation's negotiating position with potentially adverse consequences for other traded sectors.

In a policy sense, the most effective way for Australia to make its sentiments known about these protective measures, is to use international forums such as GATT, to highlight the costs of 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 formal market access restraints bilaterally, as well as in the GATT Uruguay Round.

Table 10.1: Non-tariff measures affecting international trade in minerals

<i>Measure</i>	<i>Mineral</i>	<i>Importers</i>
Government subsidies ^a	Iron and steel India,	Indonesia, Korea, France, Sweden
	Ferro alloys	Canada
	Copper ores and concentrates	India, Sweden
	Nickel ores and concentrates	Greece
	Zinc ores and concentrates and unwrought zinc	France
	Aluminium	European Community
	CoalCanada,	Belgium, France, Portugal, Spain, United Kingdom, India, Japan, FR Germany
State trading ^b	Iron and steel Indonesia,	India
	Copper ores and concentrates	Portugal, India
	Nickel ores and concentrates	Greece, India
	Zinc and lead ores and concentrates	India
	Aluminium	France, Italy, Spain, India, Greece, Indonesia, Norway
	Mineral sandsFrance,	Finland
	CoalEuropean Community,	India
Taxes ^c	Copper ores and concentrates	Austria, Italy
	Nickel, zinc and tin ores and concentrates	Austria
	Iron and steel	India
Quantitative restrictions	Copper and lead ores and concentrates	Yugoslavia
	Nickel ores and concentrates	India, Japan, Switzerland, Yugoslavia
	Aluminium	European Community, Yugoslavia
	Zinc and tin ores and concentrates	India, Japan, Switzerland, Yugoslavia
	Iron and steel Indonesia,	Yugoslavia
	Refined and unrefined copper	Yugoslavia

Table 10.1 (cont): Non-tariff measures affecting international trade in minerals

<i>Measure</i>	<i>Mineral</i>	<i>Importers</i>
Government price support schemes	Unwrought tin	Thailand, Yugoslavia
	Ferro alloys	European Community, France, Italy, FR Germany, Yugoslavia
	Unwrought zinc	European Community, India, Yugoslavia
	Coal	European Community, India, Japan
	Unrefined copper and mattes	Japan, Korea
Import embargoes	Coal	Canada, France, FR Germany, Japan, United Kingdom
	Unwrought nickel	Switzerland
Licensing, including for monitoring purposes	Copper mattes	Indonesia
	Unwrought tin and nickel	India
	Unwrought zinc, unrefined copper, nickel and tin ores and concentrates	Korea
	Zinc and lead ores and concentrates	Korea, Japan, Thailand, India, Switzerland
	Copper ores and concentrates	Switzerland Korea, Japan, India
	Coal	Korea, Philippines, Switzerland

a Includes: government funded infrastructure; concessional loans, labour costs, taxation; and reduced or repaid environmental costs.

b Includes the direct involvement of government in production and/or marketing, through national marketing organisations and centralised buying.

c Including duty surcharges or other fees, discriminatory taxes against imports and duties additional to the tariff.

Source: Department of Foreign Affairs and Trade (1989).

Box 10.1: Coal subsidisation in the former Federal Republic of Germany

The insulation of large domestic markets from import competition constitutes a major barrier to the international trade of coal. The Federal Republic of Germany was one country which gave extensive protection to its high cost domestic coal production. Since unification there has been no indication that this situation will change in the short run. In 1988 West Germany was one of Europe's largest producers and consumers of coal, mining approximately 79 Mt of hard coal (coking and steaming coals) and 108 Mt of brown coal (CIE 1990, p.1), and with over 95 per cent of its primary coal requirements being supplied domestically. Most German hard coal is uneconomic, and rising costs and falling import prices (due to falling energy prices and the consequent appreciation of the German currency) have worsened the competitive position of the industry in recent years. The main forms of assistance to the German coal industry include:

- . domestic subsidies financed directly by the taxpayer;
- . taxes on downstream users of electricity; and
- . quantitative restrictions against cheaper imports.

The financial equivalent of assistance, measured in terms of a producer subsidy equivalent, has risen sharply in recent years to reach DM 10.6 billion in 1987 (CIE 1990, p.ii) (\$A8.5b). By comparison, Australia, as the world's largest coal exporter, received only \$A4.8b in 1987-88 from total coal export revenue (ABARE 1989, p.10). This level of assistance is designed to compensate for the massive price differential between domestic and imported coal. That is in 1987 German hard coal producers received DM 295 per tonne of coal, while the equivalent price for imported coal was only DM 79.(CIE 1990, p.i)

CIE identified the following additional costs imposed on the German coal industry by these subsidisation practices:

- . higher iron, steel and electricity generation costs, plus reduced international competitiveness of all electricity using industries;
- . taxes are higher than need be to finance coal industry subsidies;
- . resources are wasted in monitoring and administering coal industry assistance policies; and
- . the continued pursuit of such policies weakens Germany's credibility in international negotiations on freer trade.(CIE 1990, pp.i-ii)

The economy-wide gain of the removal of this assistance would be an improvement in national income of DM 38 billion annually, and a boost of total employment of 157 000 jobs (after taking into account the loss of around 100,000 jobs in the hard coal industry)(CIE 1990, p.ii). Thus the elimination of coal industry assistance would be in Germany's own best interests. In addition Australia would benefit from reductions in these policies. AMIC suggested (sub. 29, p.63) that:

The potential for expanded exports of coal by Australia into the FRG market is quite high..., and such changes could result in an expansion in Australian coal exports by between 5-8 million tonnes based on current world coal trade shares and an increase in FRG coal imports (allied to reduction in inefficient domestic production) of between 25 and 40 million tonnes by the year 2000.

10.9 Conclusions

Government should limit intervention in the marketing environment unless clear rationales exist; that is intervention should be confined to overcoming market barriers. In this context, Australia's credibility when pressuring other Governments to remove its trade barriers would be strengthened by the continued removal of barriers present in Australia.

These broad principles translate into a number of specific recommendations:

- that remaining export controls be removed (except those in relation to the nuclear non-proliferation treaty and Australian safeguard arrangements);
- that the export duty on coal be abolished (ideally, in concert with reform of state royalty arrangements);
- that the Australian Government continue to press for the reductions of tariff and non-tariff barriers erected by other nations (eg in the Uruguay Round).

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11 Foreign Investment Regulation

The mining industry is subject to more restrictive foreign investment regulations than those applying to most other Australian industries. This differential treatment impedes the performance of the industry, leading to uncertainties, delays, and inefficient project decisions (eg unsatisfactory joint venture arrangements). There is a strong case for bringing foreign investment regulations as they apply to the mining industry into line with those applying to Australian industries generally.

Foreign investment regulations are used by the Commonwealth Government to control investment in the mining industry. This is another example of an indirect policy which gives the Commonwealth Government powers in relation to the development of Australia's mineral resources. The Government's administration of its foreign investment policy is based on the *Foreign Takeovers Act 1975*. Given the high capital requirements of the mining industry, foreign investment regulations have the potential to impede significantly the development of the industry. The following discussion outlines foreign investment controls as they apply to the mining industry, and the reasons behind them, and analyses their effects.

11.1 Background information

In general the Commonwealth Government's foreign investment policy has moved from an open door policy following World War II, towards a more restrictive policy during the 1960s and the early years of the seventies. In part this can be attributed to the increasing doubts surrounding the extent of foreign ownership and control of the Australian mining industry.¹ On April 1 1976 new foreign investment guidelines were outlined and the Foreign Investment Review Board (FIRB) was established. The FIRB scrutinizes foreign investment proposals in Australia to ensure that, as far as possible, potential investors have attracted the required level of local equity, and that proposals are not contrary to the national interest.

Existing foreign investment regulations

Apart from the media, banking, civil aviation, urban real estate and minerals (other than oil and gas) industries, all foreign investment proposals of \$10 million or more (including mineral processing)² are examined without the need to demonstrate economic benefits or provide for Australian equity participation and are approved unless the proposal is contrary to the national interest. The current applications of foreign investment policy in relation to the Australian mining industry include:

¹ The level of foreign ownership increased dramatically from approximately 27 per cent in 1963 to 52 per cent in 1974-75 and foreign control from 37 per cent to 59 per cent over the same period (ABS 1968, 1976)

² These include manufacturing, services, resource processing, oil and gas, non-bank financial intermediaries, insurance, stockbroking, tourism (hotels and resorts), rural properties, agriculture, forestry and fishing. (Department of the Treasury 1990, p.5)

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- Foreign interests granted a mineral exploration right from a Commonwealth, State or Territory authority are not required to seek approval under foreign investment policy to take up the exploration right. Proposals to acquire an interest in an existing mineral exploration right (through, for example, 'farm-in' or 'farm-out' arrangements or a re-arrangement of interests in an exploration joint venture agreement) are exempt from examination under the *Foreign Acquisitions and Takeovers Act...*
 - A proposal for a new mining business or project involving total investment of \$10 million or more which is not contrary to the national interest will, as a general rule, be allowed to proceed if it has a minimum 50 per cent Australian equity together with at least 50 per cent of the voting strength on the board or controlling body of the project held by Australian interests ... A proposal which does not meet these guidelines may still be allowed to proceed if it is considered not otherwise contrary to the national interest and if the Government judges that the unavailability of sufficient Australian equity capital on reasonable terms and conditions would unduly delay the development of Australia's natural resources. In that event, however, the Government will, as appropriate, seek satisfactory arrangements for the guidelines to be met within an agreed period...
 - Proposals for the acquisition of an interest in an existing mining business, which has total assets valued at more than \$5 million, are normally approved where it is demonstrated that there are sufficient economic benefits to offset any reduction in Australian ownership and control or where the foreign interest making the acquisition is Australian controlled."(Department of the Treasury, 1990, pp.6-7)

Current foreign investment regulations allow companies with varying percentages of foreign ownership to be deemed by the Treasurer to be naturalised or naturalising companies³. 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, unlike Australian companies which only need 50 per cent Australian equity and joint control to satisfy requirements, with a new development naturalised or naturalising companies are still subject to the provisions of the Foreign Takeovers Act and to the scrutiny of the FIRB for ventures involving any other foreign companies.

³ 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 must be Australian citizens; and public commitment must be given to increase Australian equity to 51 per cent, subject to agreement between company, major shareholders and Government.(Department of the Treasury 1990, p.14)

Level of foreign investment in mining

The most recent figures available indicate that in 1984-85, 44.7 per cent of mining companies were foreign owned and 55.3 per cent Australian owned.⁴ Foreign interests controlled 15.2 per cent of the mining industry; joint foreign and Australian control 24.8 per cent; naturalised or naturalising companies 11.5 per cent; and Australian companies controlled 48.5 per cent. During the same year foreign control in the mineral exploration industry (other than for petroleum) accounted for 34.7 per cent, joint foreign and Australian 0.2 per cent, naturalised or naturalising 15.9 per cent, and 49.1 per cent control was held by Australians (ABS 1986). This material, plus comparative data is found in Table 11.1.

Table 11.1: Foreign ownership and control: Selected industry sectors and activities
(per cent)

Industry/activity	Ownership		Control			
	Foreign	Australian	Foreign	Joint foreign and Australian	Naturalised or naturalising	Australian
	%	%	%	%	%	%
Mining industry 1984-85a	44.7	55.3	15.2	24.8	11.5	48.5
Manufacturing industry 1982-83a	32.9	67.1	32.1	1.2	1.3	65.4
Transport industry 1983-84a	5.1	94.9	3.4	0.1	c	96.5
Mineral exploration 1984-85b	na	na	34.7	0.2	15.9	49.1

na Not available

a Measure used to calculate ownership/control was value added (\$ million).

b Measure used to calculate ownership/control was exploration expenditure (\$ million)

c Included in joint foreign and Australian control.

Source: Australian Bureau of Statistics, Foreign Ownership and Control of the Mining Industry, Australia 1984-85.

11.2 Arguments for foreign investment regulations and their merit

Foreign investment regulations have been used since the early 1970s to regulate the mining industry in an attempt to retain a certain percentage of Australian ownership and control in that industry, in the national interest. The following discussion presents and assesses a number of arguments used to justify this form of government intervention.

⁴ Foreign ownership statistics are a measure of the total beneficial equity interest held by foreign residents in enterprises in Australia. Foreign control statistics provide a measure of the potential control, through the ownership of voting shares, that foreign residents may have over the key policy decisions of enterprises in Australia.

Will foreign companies pursue policies in the national interest?

Australia's non-renewable mineral resources are generally owned by State Governments, on behalf of the Australian community, and are considered to be part of the national heritage which exists for the benefit of all citizens (See Part 1, Section 2). 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)

One argument often raised in support of foreign investment regulations on non-renewable resources, in the national interest, is that a large proportion of profits earned from the exploitation of Australian mineral resources has accrued overseas. For example, the high degree of foreign ownership has been seen as a factor contributing to the perceived inadequate benefits received by the Australian community for mineral extraction during the sixties. Thus, foreign investment regulations have been used as a surrogate for an inadequate royalty/tax system.

Another rationale often used to support foreign investment regulations in the national interest, is that they are a mechanism to restrict overseas companies engaging in transfer pricing strategies. Transfer pricing occurs when companies avoid Australian taxes by manipulating either input or output prices in such a fashion as to reduce reported profits. There are several vehicles available for the transferral of profits to low tax centres 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 the parent company, and artificially low prices paid for the host country products. Some argue that foreign owned companies use this practice since the locus of decision making is often outside Australia, meaning that decisions are made with respect to maximising profit on a global instead of a national basis.

The United Mineworkers Federation of Australia believed (UMFA, sub. 23, p.13) this activity was a possibility and suggested that tighter supervision of international investment may be necessary. On the other hand, numerous participants (eg Alcoa of Australia (Alcoa, sub. 16, p.22), the Australian Coal Association (ACA, sub. 71, p.12), and CRA Ltd (CRA, sub. 73, p.98) argued that this concern was unfounded. Whilst it was recognized by various participants (eg Alcoa, sub. 16, p.22) that the Government has an interest in ensuring that transactions between related companies are made at arms length, it was suggested by the Australian Mining Industry Council (AMIC, sub. 95, p.13) that taxation arrangements are a more appropriate policy instrument for dealing with the problem of profits accruing to overseas owners of Australia's mineral resources. In addition, ACA pointed out that all producers' pricing policies are subject to the scrutiny of the 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." (ACA, sub. 71, p.13).

As an alternative proposition, Placer submitted (sub. 88, pp.7-8) that the national interest was served in many ways through foreign investment, including technology transfer, employment and training, construction which sources materials locally, infrastructure development in remote areas, contributions to government revenue, and development of downstream processing activities. These were seen to "far outweigh questions of equity and control" (Transcript, p.1463). Placer claimed that these benefits were not sufficiently considered when determining whether a venture is in the national interest.

In addition, Shell Australia submitted (sub. 66, p.5) 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 so 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".

The Commission believes that foreign investment regulations are an indirect method of ensuring that the Australian community benefits from Australia's mineral wealth, and considers that royalty and tax systems provide a more appropriate policy response to ensure adequate returns. In this regard, it is pertinent to note that in 1988 the Commonwealth's rationale for removing the foreign investment regulations governing new oil and gas developments of over \$10 million was the introduction of the resource rent tax for offshore oil and gas, and the resource rent royalty for onshore oil and gas (Treasurer 1988). The foreign investment policy was seen to be a "redundant restriction" since the reform of the taxation system now ensured that adequate returns were accruing to Australia from oil and gas.

Will foreigners make inappropriate management decisions?

Supporters of foreign investment regulation sometimes claim that foreign owned and controlled firms may make management decisions without fully understanding factors such as Australia's national identity, the preservation of the Australian culture, plus other economic and political aspirations of the Australian community. For example, Consolidated Rutile (Transcript, p.747) stated that (in relation to foreign equity in mineral sands) the corporate objectives of foreign companies "are not necessarily the same as Australian companies".

One special concern is that foreign companies may have different attitudes towards closing down mining operations and engaging in local processing. For example, the NSW Government submitted (sub. 52, p.73) that since foreign investors often have mineral processing operations or close ties to such processors, plus a great familiarity with foreign industrial capacity to construct, supply and operate processing plants, foreign investment may result in fewer opportunities for processing in Australia than would corresponding local investment.

Alternatively, AMIC proposed (sub. 95, p.13) that foreign companies generally face the same input and product prices as Australian mines, thus resulting in identical optimal decisions in relation to closing operations, and engaging in local processing. The Commission believes that, from an economic efficiency perspective, the Australian community does not benefit if the government provides assistance to either a domestic or foreign controlled firm to establish/maintain inefficient processing operations in Australia.⁵

⁵ For a more detailed discussion on the viability of further processing of Australia's raw materials see Chapter 7, Volume 1.

Another concern is that foreign ownership can lead to underinvestment in research and development. Yet, it is not clear why foreigners, who have a vested interest in receiving the highest return possible, would contribute to less research and development than the optimum level. 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 the Treasury 1990, p.v)

Even if the level of research and development undertaken were insufficient, foreign investment regulations are an indirect and thus inappropriate means of dealing with the matter. The issue of appropriate levels of research and development is discussed in more detail in Section 20: Research and Development and Access to Technology.

Does foreign investment result in foreign owners having an unfair buyer advantage?

The 'conspiracy theory' is another argument put forward in support of foreign investment regulation. It has been stated that foreign owners of Australia's minerals will have greater insight into the level of profitability of companies, plus an insight into their cost structures, and may be in a better bargaining position in purchase negotiations which could result in lower prices being received for minerals produced. The NSW Government proposed that this risk, whether real or imagined, needed to be balanced against the potential benefits of technology transfer, capital investment and market access.(NSW Government, sub. 52, p.73, and sub. 162, p.27, Transcript, p.1214).

Oakbridge opposed this view and drew the Commission's attention to its two overseas shareholders (at the parent level), Toyomenka and Marubeni (Transcript, pp.1048-9). Oakbridge submitted that Toyomenka represented a significant quantity of Oakbridge's tonnage into Japan (into the steel mill area) while Marubeni represented a significant quantity of steaming coal from the Hunter Valley (also in 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 as their equity positions were too small to give board representation.

11.3 Further considerations in assessing foreign investment regulations

Various costs and uncertainties are imposed on the mining industry due to the imposition of foreign investment regulations which should be recognised and taken into account when assessing the impact of those regulations.

The costs of compliance

As shown in Table 11.2, only eight mining proposals have been rejected since 1983-84 under the Government's foreign investment policy. However, these figures understate the effect which these regulations have had on the industry. Four proposals were withdrawn from FIRB examination during the period, while 127 proposals were conditionally approved. Conditional approvals also

impose costs and restrictions on the proponent, such as a requirement to increase Australian equity over time. In addition various participants (eg ACIL, sub. 53, p.2; AMIC, sub. 95, p.12) indicated that the foreign investment guidelines may have deterred projects from even progressing to the application stage. Western Mining Corporation (WMC) commented that, even though the activity of the FIRB has been reduced, there remains an underlying perception that it may be used to intervene in relation to a controversial issue.

Table 11.2: Mining^a proposals assessed by the FIRB 1983-89
(\$ million and number)

Year	Approved		Conditionally Approved		No. Pro- posals rejected	No. Pro- posals withdraw	Value of pro- posals rejected		Total
	No.	Total expected invest.	No.	Total expected invest.			No.	Total expect. invest.	
1983/84	149	398.49	24	662.43	1	-	1.1	174	1060.92
1984/85	126	330.14	28	58.56	2	1	7.73	157	388.70
1985/86	56	274.73	39	291.65	3	-	6.0	98	566.38
1986/87	64	2118.10	32	317.10	1	-	9.0	97	2435.20
1987/88	71	2305.03	4	314.00	-	3	-	78	2619.03
1988/89	87	2157.01	-	-	1	-	32.0	88	2157.01

a ASIC codes 11-16, includes minerals under reference and oil and gas (not under reference).

Source: Correspondence with the Foreign Investment Review Board and Annual Reports 1983-4 - 1988-9

ACIL suggested (sub. 53, p.2) that, even though foreign investment controls are very rarely enforced, they still have an administrative and compliance cost which 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, and can result in lost export opportunities (ACIL, sub. 53, p.2). As an example, EXXON Coal and Minerals Australia Limited submitted (sub. 58, p.16) that the need for Government approval:

... complicates delays and increases the uncertainty in the process of developing markets, financing the project, obtaining other necessary government approvals and committing to and initiating development for projects which can cost in excess of \$500 million.

These negative influences were seen to translate into significant costs not only for the enterprises concerned but also for the industry and economy at large. ACIL submitted (sub. 53, p.2) that these regulations can induce decisions at the margin to invest in capacity outside Australia, while WMC stated (sub. 69, p.45) that it had cancelled or postponed otherwise viable operations in the past.

Are foreign investment regulations discriminatory?

Mineral exploration and extraction ventures are treated differently under foreign investment regulations. Placer believed (sub. 88, p.7) this policy was inequitable since foreign companies were invited to explore for minerals in Australia, thus using their expertise and risking their shareholders' funds, however they were then not allowed to control a project that eventuated from these efforts, exposures and technical contributions. In addition, the policy can effectively

discourage investment in exploration since foreign investors may be reluctant to invest money when they are faced with the prospect of not being able to control the project if an ore body is found.

Foreign investment policy also differs between existing and new mines. This differential treatment was seen by various participants (eg AMIC, sub. 95, p.11, ACIL, sub. 53, p.2) to be irregular, and as having the potential to direct foreign investment to existing projects at the expense of new projects, that is, trading existing productive assets instead of the creation of new productive assets.

Foreign investment regulations also differ between naturalising, naturalised and Australian companies (see pages 11.2 above). CRA questioned (sub. 73, p.100) why a naturalised company was likely to have a greater propensity to act in a way inimical to the national interest, when the premise behind the establishment of naturalised companies was, according to CRA, that such companies should be treated and regarded as Australian companies. According to CRA:

... the delay involved in seeking such approvals creates an atmosphere of uncertainty and requires the application of considerable senior executive time.

The Australian mining industry has been chosen for 'special treatment' within foreign investment policy because of the considerations discussed above. Participants argued (eg AMIC, sub. 95, p.11) that this created inconsistencies between industries and distorted the allocation of foreign and, because of risk effects, domestic investment away from mining to other activities. The Commission believes the policy has the potential to distort the allocation of resources within Australia, at the expense of the mining industry.

What effects do foreign investment regulations have on the structure of companies?

Shell submitted (sub. 66, p.6) that a cost arising from foreign investment regulations has been that companies may be forced to make their investments through joint ventures. This was seen to be an appropriate arrangement for large projects where risk needs to be spread and expertise and technology gathered from several sources. However, 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.(Shell, sub. 66, p.6)

ACIL proposed (sub. 53, p.2) that the financial structure of a joint venture was an important consideration for prospective customers as well as for the venture's cost competitiveness. It argued that these ventures may be less sound with compulsory Australian participation because of the possibility of a higher proportion of underlying debt (ie uncertainty is created in customers' minds about the stability and continuity of a joint venture).

Do foreign investment regulations distort the financing of a venture?

The Australian mining industry has become increasingly capital intensive. Thus the availability of capital is an important issue in relation to the financing of a venture. It was suggested by various participants (Placer, sub. 88, p.6, AMIC sub. 95, p.14, UMFA, sub. 23, p.13) that at present there is insufficient risk capital readily available to satisfy FIRB requirements, and thus the continued expansion of the Australian mining industry.

Shell argued (sub. 66, p.6) that, if insufficient risk capital is available and foreign investment regulations are not changed, the overall development of the Australian mining industry and the growth of the economy as a whole could be impeded since investment projects may be postponed or their viability jeopardised.

In addition, a common view held by participants is that foreign investment controls have contributed to an overreliance on debt at the expense of equity for individual projects (eg AMIC, sub. 95, p.12, WMC, sub. 69, p.45). This can result in mining ventures which are less resilient in the face of downturns in commodity prices.

Macro-economic considerations

Some have argued that greater foreign control of Australian industry reduces the effectiveness of macro-economic stabilisation policies and this provides another justification for restricting foreign investment.⁶ AMIC suggested (sub. 95, p.14) that foreign investment regulations were destabilising, and that their removal would enable the Government to exercise greater control over the domestic business cycle. In relation to Australia's international debt, Shell proposed (sub. 66, p.6) that foreign investment controls had reduced the flexibility of economic policy since they had contributed to the growth in Australian liabilities in the form of debt as opposed to equity. (For a more detailed discussion on macro-economic factors see Section 19, Volume 3)

11.4 Conclusion

The extent of foreign investment which should be permitted in the Australian mining industry has been keenly debated since the late 1960s. When assessing the overall effects of the regulations, it is important to take into account the opportunity cost to the Australian community of mineral development foregone. The regulations are seen by the majority of participants to be discriminatory, they can have a detrimental effect on company structures and the financing of ventures, and they create additional administrative and compliance costs. While it is appropriate that the Australian community receives adequate benefits from the development of publicly owned resources, the Commission does not believe that this supports the differential foreign investment regime currently applying to the mining industry. Alternative policy measures exist (eg taxation and royalty policies) to protect the nation's interests sufficiently, without having to resort to an indirect measure which has the potential to impede the efficient development of Australia's mineral resources significantly. The Commission therefore recommends that foreign investment regulations applying to mining be brought in line with those applying to industry generally.

⁶ See, for example, Wheelwright (1982), p.48.

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12 STATE GOVERNMENT REGULATION

In Australia, primary jurisdiction over mineral resources rests with State governments. This section describes and analyses the effects of various aspects of State legislations which apply to mining and minerals processing activities. Substantial costs and inefficiencies arise from the complex, unco-ordinated, inconsistent, and sometimes outdated web of regulations. Some possible solutions to these problems are canvassed.

12.1 Introduction

Under the Australian Constitution, ownership of mineral resources is vested in State legislatures. Unlike other countries characterized by Crown ownership, jurisdiction over natural resources in Australia resides at the sub-national level of government as opposed to the national level of government.

The Mining Acts in each State and Territory are the major legislation determining conditions of mineral development. The Acts specify which procedures are to be followed in the exploration for and exploitation of all minerals (except for coal in New South Wales which is covered under a separate Act).¹ Mining Acts cover matters such as leases/licences/permits relating to prospecting, exploration, mining and other miscellaneous issues.

In addition to the Mining Acts of the respective States and Territories, there is further legislation that impacts upon the mining industry. This legislation covers a wide range of issues ranging from planning acts to acts that deal with a whole gambit of primarily environmental issues such as noise, water and air pollution controls. Each state also has a National Parks Act which impacts on some mining operations.

State Agreement Acts are also used in some States. These Acts are used to regulate the development of large individual mining projects. State Agreement Acts specify in advance the contributions and obligations of the developer and the government and help to remove any uncertainty in the minds of the mining interest.

The following discussion examines some of the problems engendered by the existing framework of State legislations which apply to mining and minerals processing activities and suggest possible solutions to solve those problems.

In examining these regulations, the Commission has had regard to its guidelines which require it to "report on any institutional, regulatory or other arrangements subject to influence by governments in Australia which lead to insufficient resource use, and advise on courses of action to reduce or remove such inefficiencies".

¹ Coal is dealt with in the New South Wales *Coal Mining Act 1973*.

12.2 The interaction between mining and other legislation

Mining legislation is only one of a ream of State legislation that impacts upon those conducting or seeking approval to conduct exploration or mining activity. Relevant legislation includes Acts such as the Fossicking Act, Forests Act, Land Rights Act, Noise Control Act, Clean Air Act, Clean Waters Act, State Pollution Control Act, Mines Subsidence Act and the Environment Protection Act. The large number of acts that have to be complied with is illustrated by the example of mining in the Alligator Rivers Region. There are 35 Northern Territory Acts and 15 Commonwealth Acts that have to be complied with - and these acts just cover environmental protection in the area.²

Problems of duplication and delay

The mining industry complained that the general level of regulation including the overlap between departments and the variation in legislation between State jurisdictions contributed to unnecessary compliance and costly delay.

While there are good reasons for much of this regulation, the existing processes and interactions do not appear to allow for its effective application. The duplication of requirements, lack of co-ordination between government agencies and time delays in obtaining approval for mining operations is particularly disconcerting. 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.

The mining industry in Victoria (Victorian Chamber of Mines sub. 21) regards Victoria's complex and lengthy approvals procedures for obtaining authority to mine as the main barrier to the development of a strong mining industry in Victoria. They see the lack of co-ordination with other agencies and uncertainty of outcome of applications, as the main faults behind the lengthy approval system (see Box 12.1).

Furthermore, the Victorian Chamber of Mines (VCM) (sub. 21, exh.11) believes that the time required to obtain approvals in Victoria is longer than in any other State. Figures show that the average time delay in being granted a mining lease after application was 174 days and ranged from 91 days to 315 days. There were also delays in other licence approvals with averages ranging from 86 days up to 202 days (see Volume 4). Other information supplied by the VCM cites examples of projects such as Bendigo Mining N.L.'s 'Deborah Reef Project' where the company has spent \$3.3 million in complying with excessive and duplicated regulations. Another example given is BHP Gold Mines Limited's 'Gold Exploration Project Dunolly' where time delays of 12 months have cost the company well over \$900 000.

Freehill, Hollingdale and Page, stated (sub. 76, p.16):

² For examples of legislation that mining legislation interacts with see Volume 4, 'Relevant legislation being "prescribed instruments" for the purpose of *The Environment Protection (Alligator Rivers region) Act 1978* as at June 1989'.

Persons who wish to carry out mining operations in Victoria must currently negotiate a maze of regulations and regulatory authorities including the Departments of Industry, Technology and Resources, Labour and Conservation, Forests and Lands, and the Ministries for Planning and Environment and Water Resources. In addition they must deal with a number of authorities and interest groups at a local level. Depending on the project the approval of the Treasurer or other Commonwealth ministers may be required.

Box 12.1: 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.

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)

A large number of participants (eg New South Wales Coal Association sub. 45 and Oakbridge sub. 32) also regarded New South Wales as one State where approval procedures were inefficient, particularly with respect to the coal industry. The New South Wales Chamber of Mines, Metals and Extractive Industries (sub. 37, p.5) put forward the view that it is more difficult to establish projects in New South Wales than in most other States due to the complex and lengthy process in gaining planning approval (see Box 12.2) and in meeting the large number of environmental regulations. Furthermore, they contended that the concept of providing environmental protection through a wide range of legislative, judicial and public participation processes is now threatening

the ability of New South Wales and Australia to compete effectively in the international market place for exports.³

Box 12.2: Approval procedures: Gretley Colliery Experience

The Newcastle Wallsend Coal Company's southern lease extension of 382 hectares for underground mining at the Gretley Colliery was first applied for in 1977. Coal Lease 274 was granted on 30th December 1985 after difficult and time consuming procedures.

A lease gives a company a title to an area, usually with stringent conditions applying to mining activities, but not necessarily the right to mine. If the company wants to extract formed pillars or blocks of coal, then a further operational approval must be sought. At Gretley Colliery, Newcastle Wallsend intended to continue the partial extraction system that was into the southern lease extension.

In 1982 the Company commenced advance action to obtain the separate approval needed to authorise coal extraction. Formal application was made following granting of the lease, after discussions had been held with all the relevant departments and authorities. Despite continuing and intense effort, formal approval to extract coal was not forthcoming until January 1990.

At the time approval was granted there was only one day's production of coal remaining in the current approval area. The approval to extract applied only to an area of roughly five month's coal production and further approvals are required to ensure ongoing production in the area.

Source: Oakbridge Limited (sub. 32, p.26).

Only mining developments in NSW require a dual approval process whereas all other types of development require only a land use approval. The consequences of this dual approval system is that all new mining proposals are subject to the legislative and administrative procedures of both mining and environmental legislation. These procedures and requirements frequently overlap or duplicate one another, causing delay in the determination of mining applications and place unnecessary workload on both developers and government authorities. As a result, a period of some three to four years can elapse between an application for project approval and the eventual grant of development consent and a mining lease.

The New South Wales Coal Association (sub. 45, p.10) stated that:

... large mineral development projects are unnecessarily delayed and disadvantaged. The provision of the Environmental Protection Authority Act overlay those of the mining legislation and this is the prime source of duplication, conflict and delay.

The Association of Mining and Exploration Companies (AMEC) provided (sub. 115) several examples of excessive delays in the approval process in Western Australia. One such example

³ For a more detailed analysis of problems encountered in the coal industry read Chapter 22 'The Coal Industry'.

concerns CRA Exploration who have been waiting since December 1986 for a decision on whether CRA's application for access to the Jilbadgi 'C' class reserve for exploration purposes has been successful. Another example concerns Summit Gold who have been awaiting notification of application approval (which was recommended for approval) since 1986.⁴

Possible solutions

International mineral markets are highly volatile and it is critical that new projects are able to move forward rapidly if companies are to take advantage of opportunities as they arise. Thus any impediments that retard a fast response to market conditions is a significant impediment to the industry.

A number of possible solutions are suggested that enable projects to move forward with minimal delays. Some of these solutions have been implemented in some states.

One-stop shopping

As impediments impose substantial costs to the mining industry and to the community as a whole, it is important that mechanisms which streamline the approval process, whilst adequately addressing other concerns (eg. environmental effects) should be closely examined.

One way of streamlining and reducing time delays is to have one department responsible - 'one-stop shopping' - for the granting of mining leases so that the number of government departments that the expectant miner has to deal with is minimised. This department, rather than individual applicants, would then liaise with the other relevant government departments.

The Queensland Coal Association stated (sub. 70, p.9) that:

Unlike its NSW counterpart, the Queensland coal industry is generally satisfied with the non-commercial aspects of project approval and regulation to which it is subject. While the Queensland system provides adequate safeguards for local communities and mineworkers against potential deleterious affects of mining, it is sufficiently streamlined and flexible as to avoid unnecessary delays to development and disruption of operations. Central to the comparative success of the system is its compliance with the 'one stop shop' approach to industry regulation.

AMEC agreed (sub. 15, p.62) with the concept of one-stop shopping and the principles underlying it:

"One-stop shopping" should be the aim so that the proponent of a mining project only has one Government Department with which to deal. The miner should be concerned with the commercial aspects of co-ordinating a mining project and all Governmental aspects should be co-ordinated by the Department of Mines.

⁴ See Volume 4 for several examples.

The South Australian Chamber of Mines and Energy Inc. proposed (sub. 132, p.15) that one authority be responsible for the determination of applications to explore and mine. The Chamber submitted that a 'one application-one approval' system be introduced to facilitate this (see Volume 4).

An increase in administration efficiency would be achieved by removing duplication of requirements by different government departments. Within departments, the process of checking and clearing approvals needs to be looked at so that time delays are reduced. In reviewing the approvals and checking processes, there should also be a more precise outline of the requirements of the mining and exploration companies so that confusion and delay in complying with those requirements is minimised.

The Queensland Coal Association contended (sub. 70, p.10) that recent amendments to the Queensland Mining Act had led to a reduction in the unduly bureaucratic procedures or duplication of responsibilities in that State. An example of this is the amendment of the Coal Mining Act and the Inspection of Machinery and Construction Safety Acts to remove what was previously a confusing and conflicting duplication of safety regulations. All safety codes relating to coal mine structures and operations in Queensland now come under the Coal Mining Act and therefore the sole jurisdiction of the Department of Resource Industries.

In replying to criticisms levelled by participants at the New South Wales legislation and approval procedures, the New South Wales Government (sub. 162, pp.3-12) outlined many recent developments that have sought to reduce the number of impediments in the mining industry. Task forces have been established to review duplication of approvals. The leases granting process under the Mining and Coal Mining Acts is being reviewed and the implications of the review of administration of the Environmental Planning Assessment Act are also being examined. The NSW Government claims that several projects such as the Camberwell coal project and the Dartbrook coal project have benefitted from these initiatives. Also a Development Officer of the Department of Minerals and Energy has been established to undertake the role of contact officer for a 'one-stop shop' system in New South Wales. These initiatives are a move in the right direction towards reducing impediments to mining in NSW.

State Agreement Acts

State Agreement Acts spell out the entitlements and obligations of both the State and the developer, and bypass duplicated requirements overriding the existing general State legislation (including the Mining Acts). Furthermore, these agreements enable a company to calculate an accurate costing of a project as the obligations and contributions of the developer and the Government are specified in advance. Western Australia has the most State Agreement Acts of any of the states. Typically, these Agreements cover matters such as the provision of infrastructure (eg. railways, roads and port facilities, the construction of special townships, water reticulation, drainage, power and welfare facilities) and the royalty rates in relation to each project. Examples of State Agreement Acts are: *Roxby Downs (Indenture Ratification) Act 1982*; *Iron Ore (Wittenoom) Agreement Act 1972*; and *the Diamond (Ashton Joint Venture) Agreement Act* which covers the Argyle diamond mine in Western Australia. The South Australian Chamber of Mines Inc. fully endorsed (sub. 132, p.18) the implementation of State Agreement Acts as an efficient method of regulating mining operations.

12.3 Provisions in State Mining Acts

Rather than analysing each individual State Mining Act or each provision in detail, this section focuses on the features of the acts which appear to have an important impact on the development and efficiency of mining and minerals processing. It must be noted though that the Mining Acts are often changing and are currently under review.

Largely as a result of their differing histories,⁵ mining legislation differs between States although it is still possible however, to glean a general picture of the Mining Acts. Table 12.1 presents selected information by State in order to illustrate the main features of (and some of the differences between) the various State Mining Acts.

The Mining Acts have provisions covering a large range of mining aspects. They cover issues through from the inception of the idea of a mine, to rehabilitation of the mine site after mining has been completed. Types of licences that are required for the various stages of the exploration and mining process are specified within the Mining Acts.

Mining Acts categorise land into different classes (eg. occupied and unoccupied land) with the authority needed from the government to enter and explore being dependent upon the land classification. Certain classifications of land however, are exempt from mining such as land 100 metres laterally of a residence or land that is a burial ground. Other categories such as, unoccupied or freehold Crown land allow mining.

Exploration permits and production licences are granted under a 'first come first served' system provided that the applications meet work programme and other criterion. In applying for an exploration lease details of the operation and a peppercorn fee are required to accompany the application. Applications consist of detailing the proposed exploration method and the particulars of the technical and financial resources that are to be used. A surveyor's description of the boundary area accompanied by aerial photographs are also part of the application requirement.

In all cases, the owner and occupier of private lands are entitled to compensation for loss suffered - or likely to be suffered - as a consequence of the granting of a mining tenement. It is usually the case that prospecting or mining on private land cannot commence until compensation arrangements are concluded. It is now becoming more common for mine site rehabilitation requirements to be stipulated prior to the commencement of mining activity.

While the precise definition of a mining claim varies among each category of land, all definitions emphasise that a claim is a portion of land lawfully taken in possession and occupied as a claim under the Mining Acts, as distinguished from land held in other tenements. In most States, a mining claim entitles its holder to engage in mining and to dispose of metals and minerals commercially. In some States, it is necessary for a miner to hold a miner's right before taking possession of a claim. Mining leases are commonly granted for a period of 21 years and range in maximum size from 100 hectares in Tasmania to no maximum size in the Northern Territory.

⁵ See Volume 2, History Appendix G.

Table 12.1: Selected features of State Mining Legislation ^a

<i>State Mining Acts dates</i>	<i>Queensland 1968-1980</i>	<i>NSW 1973-76</i>	<i>Victoria 1958-1978</i>	<i>Tasmania 1929-1978</i>	<i>SA 1971-1976</i>	<i>WA 1978</i>	<i>NT 1980</i>
State owns all the minerals	With a few exception	Y	Y	N	Y ^b	Y ^b	Y-but not atomic
Number of Tenements			12	8	8	5	
Mineral definition includes coal	Y	N	Y	N	Y	Y	N
Mineral definition lists the minerals included	N	N	Y	N	N	By exception	
System of land categorization	Occupied Unoccupied	Crown Private	Crown Private	Crown Private Reserves	Crown Private	Crown Private Public Reserves	Crown Private Aboriginal Reserves
Some exercisable powers vested in the Governor	N	N	N	Y	Y	Y	N
Can make claim only on Crown land, not private	N	Y	N	N	N	Claims do not exist	Y
Land owner has right to veto access	N	N	Y	N	N	Y	
Need to notify land holder for access ^c	Y	Y	Y	Y	Y	Y - Leased Crown Land N - Vacant Crown Land	Y - Private

Table 12.1 (cont): Selected features of State Mining Legislation ^a

<i>State Mining Acts dates</i>	<i>Queensland 1968-1980</i>	<i>NSW 1973-76</i>	<i>Victoria 1958-1978</i>	<i>Tasmania 1929-1978</i>	<i>SA 1971-1976</i>	<i>WA 1978</i>	<i>NT 1980</i>
Period of notification required prior to entry	7 days	Under arrangement	28 days	3 days	21 days	Varies by tenement type	14 days
Maximum size for exploration lease	5	2	2	10 or determined by Minister	2	5	6
For what period are renewal of exploration leases available (Years)	Y	2	1	Determined by Minister	3		N
Time length before 50% relinquishment of exploration lease	2 (proposed)			5	No requirement to relinquish	3	2
State has Exploration Retention Lease	N			Y	Y	N	
Dealings in licences permitted?	Y With Minister's approval	N	N	Y	Y	Y	Y
Security Bonds for rehabilitation	Y			Y	Y	Proposed	

Table 12.1 (cont): Selected features of State Mining Legislation ^a

<i>State Mining Acts dates</i>	<i>Queensland 1968-1980</i>	<i>NSW 1973-76</i>	<i>Victoria 1958-1978</i>	<i>Tasmania 1929-1978</i>	<i>SA 1971-1976</i>	<i>WA 1978</i>	<i>NT 1980</i>
Do Special Agreements Acts exist?	Y	N	2	3	3	Y	
One department is Responsible for co-ordinating approvals	Y	N	N	N	Y	N	
Mining licence is only for a specific mineral	N	Y	N - except for gold	N - except for coal	N	N except iron ore and special circumstances	Y
Requires separate consent for both mining and exploration stages	Y	Y	Y	Y	Y	Y	N
Maximum Mining lease term (years)	On request	21	16	21	21	21	21
Maximum Mining lease area	130ha but may be granted more by Minister		260ha gold - unlimited	100ha coal 200 ha	250 ha	100ha	400ha
Expenditure conditions apply to Mining lease	Y	Y	Y	N	N	Y	Y

Table 12.1 (cont): Selected features of State Mining Legislation ^a

<i>State Mining Acts dates</i>	<i>Queensland 1968-1980</i>	<i>NSW 1973-76</i>	<i>Victoria 1958-1978</i>	<i>Tasmania 1929-1978</i>	<i>SA 1971-1976</i>	<i>WA 1978</i>	<i>NT 1980</i>
Do labour conditions apply to mining leases	N	Y or Expenditure conditions	Y and Expenditure conditions	Y	Y	N	
Renewal of Mining lease (years)	21	15	21	21	21	21	
Can have unlimited adjoining Mining leases			Y	Y	Y	Y	
Mining legislation is integrated with other legislation	N	Y	N	N	Y	Y	

NOTES:

a no major mining has taken place in the ACT

b With the exception of some private mines

c Typically land is exempt from mining if it is a reserve or within 100m laterally of private home, or 50m laterally of a stockyard, dam, cemetery or burial place.

d Leases of larger size may be granted at the discretion of the relevant Minister

e Other Acts are referred to and made part of the conditions imposed by the Mineral Resources Acts.

Source: Forbes and Land, 1987.
State Mining Acts.
Various submissions.

When carrying out actual mining operations, the mining lease stipulates the obligations and requirements of the miner. Issues that are covered in this phase of the mining operation include conditions that prescribe the minimum expenditure level and/or the minimum number of workers required to work the lease. Royalties, rentals, fees and charges associated with mining are also outlined.

Environmental controls such as restrictions on mining methods, noise control and the disposal or storage of waste chemicals are encompassed within the Mining Acts. An Environmental Effects Statement is required for major mining developments and this commonly results in further conditions being placed on the mining tenement.

In submissions received by the Commission there was a number of general grievances aired by participants with regard to the State Mining Acts. It should be noted that each of the States' Mining Acts differ quite markedly and these are general grievances that may not prevail in all States. There was little complaint from mining participants about the South Australian legislation and the new Queensland legislation now in force. The following section focuses on some of the grievances and then offers some solutions to resolve them.

Administrative discretion

The general thrust of participants' comments on the issue of administrative discretion was that the amount of administrative discretion should be minimised. Furthermore, participants believe that reasons for refusal of applications should be outlined beforehand, be consistent and open to public scrutiny.

Freehill Hollingdale and Page stated (sub. 76, p.10) that:

The role of ministerial discretion in the licensing and approval process should be minimised as far as possible. Where it is appropriate that a Minister have discretion, specific guidelines setting out government policy and the relevant matters to be taken into account by the Minister should be published.

In discussing administration of the Acts in the various States, CRA complained (sub. 73, p.28) about:

- Unclear processes with no time limits, involving a myriad of government departments (particularly where environmental or aboriginal issues are involved) and in some instances, Parliamentary proceedings
- An increasing number of conditions attached to titles, many subject to arbitrary decisions on performance and thus increasing insecurity of title

In the Commission's view, there should be a degree of accountability in the approvals process so that exploration and mining companies are not left speculating as to why their application failed, or when they will be notified of their application's success or failure. There should be a set time for approvals ie. the respective government department would have to give a positive or negative reply to the development request within a designated time. Also, if the application failed, the reasons as to why the application failed should be pointed out to the applicant.

Outdated concepts

Most of the current mining legislation in Australia is a modification of older legislation. Because of this, much of the existing mining legislation in Australia is based on historical concepts which are now outdated. Due to the many advances in technology and mining techniques the old legislative framework has now become inappropriate (see Box 12.3).

Box 12.3: Outdated legislation - NSW Coal

Approvals are required for a great many operational decisions under legislation which contains provisions that are completely anachronistic. Approval requirements governing the extraction of pillars, for instance, were imposed decades ago to protect the jobs of hand pick-and-shovel miners; they were continued with little reason, into the era of mechanised bord and pillar mining; and they are now imposed on longwall mining operations for reasons which bear no relationship to the original purpose. Every longwall block planned for mining requires approval under these provisions. Again, brinkmanship has often been the order of the day and approvals have not been forthcoming until the last moment.

Source: Oakbridge Limited (sub. 32, p.28)

AMEC stated (sub. 15, p.46) that:

The failure to base legislation on current concepts has lead to unduly complicated and complex laws which contain some very convoluted or unintelligible drafting. Often the Regulations are as complex as the Act and this leads to confusion and the possibility that some of the Regulations are ultra vires (beyond power).

Similarly, Oakbridge Limited stated (sub. 32, p.22) that:

The size of blocks made available for mining leases or, more particularly, the reserves contained within the blocks, are too small to sustain the scale of operation, feasible with modern coal mining technology, that minimizes average costs.

New and future technology advances need be incorporated into the mining industry so that efficient and cost effective techniques can be utilised. The failure to update legislation in line with technology advances holds mining companies back from implementing these more cost efficient processes. Therefore, mining legislation should be updated and periodically reviewed to incorporate advances in technology and mining techniques.

In addition to outdated legislation there is no provision for flexibility in applying mining regulations (see Box 12.4).

Box 12.4: Strict compliance problems

Regulation 59 under the Mining Regulations 1981 sets forth the prescribed requirements underlying the need to mark boundary lines by pegs or cairns 'in the ground at intervals not exceeding 300 metres'.

The Mining Warden dismissed an application for a mining tenement because there had been a non-compliance with the Regulations in that the boundary markers had been set at intervals exceeding the prescribed 300 metres. One was on the northern boundary, being 302 metres; others were on the southern boundary, being 301 metres and 303 metres. In all other respects, there was compliance with the marking out requirements, so that non-compliance was minor and could not have misled anyone inspecting the land with a view to identifying the area of land claimed.

Source: AMPLA (sub. 12, pp.9-10)

The NSW Coal Association believes (sub. 45, p.10) that:

The major impediments to streamlined and efficient procedures lie within the provisions of the EPA Act, which specifies a rigid set of requirements to be followed, regardless of the nature, scale or location of individual mining proposals.

A degree of flexibility should be introduced in applying legislation as some situations - such as the one depicted in Box 12.4 above illustrates - clearly have circumstances where not following regulations to the letter is acceptable provided the principle intent of the regulation is not violated.

Lack of consistency between States

Lack of consistency in the States' mining legislation was seen by participants to be an area where improvements in efficiency could be made.

AMEC stated (sub. 15, p.45) that:

... a substantial degree of consistency in principles is achievable and is a worthwhile objective. At present, many of the principles of the legislation in each of the States and Territories are different. This is very confusing for a mining company engaged in exploration and mining on a national basis.

The Australian Mining and Petroleum Law Association Limited (AMPLA) stated (sub. 12, p.11) that:

The Association recognises that there may be different situations to be dealt with in each of the States and Territories which necessitate a different legislative response. However the Association considers that a substantial degree of consistency can and should be achieved. In particular, there is scope for consistency in mining legislation in relation to matters such as application for and granting of mining titles, registration of title and dealings with mining titles.

Inconsistencies in the various States' and Territories' legislation starts from their definition of "mineral" and inconsistencies continue throughout their mining tenements (see Table 12.1). At times it is difficult to isolate common principles running through the different Mining Acts.

Inconsistencies and unnecessary differences in legislation between the States are a source of unnecessary extra costs to mining companies. AMEC stated (sub. 15, p.47) that "reports and rents are due on many different dates on tenements which comprise one exploration project or one mine. This can be an administrative nightmare."

Greater uniformity could be established between State Mining Acts. More consistent legislation would contain similar principles but allow for different circumstances in each of the States or Territories so that the administration costs/time for exploration/mining companies operating in more than one State is minimised.

Specific areas of concern

Some particular provisions applying in State Mining Acts have significant impacts on the efficiency of resource use within the mining industry. The following discussion examines a number of these.

Tenement structure

Each of the States has its own tenement structure. In some States mining titles are granted under the Land Act but in most States mining titles are granted under the Mining Act.

Some titles and authorities are non-discretionary and are mandatory rights - the authority is automatically issued on receipt of a valid application. Tenements can be conditioned with respect to the manner of operation and rehabilitation requirements.

AMEC stated (sub. 15, p.54) that in some States the variety and number of tenements is unnecessarily large and confusing and that there is a large need for only five tenements - an exploratory tenement, a retention tenement, a production tenement and two ancillary tenements.

The Commission agrees that a general reduction in the number of tenements would simplify administration and reduce confusion and costs for all parties.

Security and progression of Title

All States require separate consent for both mining and exploration stages while the NT allow the miner to proceed directly from exploration to mining (provided all conditions of the lease are met).

Mining interests see the need to gain additional consent to mine after exploration has been carried out as a major impediment to their activities. On behalf of mining interests the AMPLA stated (sub. 12, p.3) that:

Security of Title is a significant issue to the mining industry. Any uncertainty as to title is certain to be a major factor in discouraging the exploration for and development of mineral resources.

Environmental and landholder groups on the other hand view the option to veto mining after exploration has taken place as a fundamental right. The Landholders Association stated (sub. 137, p.2) that:

... existing rights, such as landholders having total power of veto over mining associated activities on freehold land in Western Australia, should always remain. To make illegal today that which was law yesterday is unacceptable in a society which we call democratic.

Sections 5 and 6 discuss the environmentalist and landholder arguments in more detail.

The Commission does not accept that the holder of an exploration licence should have an 'absolute right' to convert an exploration licence into a mining lease. This is because there may be good reasons (eg environmental concerns) where society would be best served by refusal to grant such title progression. However, the processes involved in the progression of title and the rules that apply to that progression should be clearly laid out beforehand so that the explorer has prior knowledge of the rules and is aware of the reasons behind a refusal if it occurs.

Control over dealings in Titles

A common feature of the legislative regime in respect to exploration and mining titles is governmental control over dealings in titles. Broadly speaking, ministerial approval is required for all dealings in major exploration and mining titles. The methods and extent of control and registration do vary however from jurisdiction to jurisdiction.

The AMPLA believe (sub. 12, p.7) that the greater the degree of control by government, the greater the cost to the mining industry and the government. There are administrative costs in processing documents. Costs are also incurred due to time delays in obtaining approvals. Documents dealing with mining tenements are often complex and complicated legal documents. Furthermore, the AMPLA also believe that departmental officers are usually not trained to interpret such documents and there is every likelihood of delay and error occurring where such documents require approval.

As rights are granted in 'one on one' legal agreements by the government they are not readily transferable and hence there can be no bidding or trading of exploration or mining rights.

AMEC disagrees (sub. 15, p.61) with this approach of non-transferable property rights:

A Government's concern should be that ground is explored. It should not matter whether it is the original holder of the exploration licence or someone else who performs that exploration.

Non-transferability of property rights means that any party - other than those holding the property rights - cannot obtain the property rights of a reserve even though they may be in a better position to maximise the net resource value of that reserve. If the transferability of property rights were

permitted however, then the rights could be auctioned off to the highest bidder resulting in an efficient outcome whereby the party with the least cost exploration/extraction technique could afford to bid the highest for those rights because in the long run their overall cost will be lower than any other company.

The Commission believes that the degree of governmental control over the dealings in titles should be minimised so that time delays are reduced. Officers responsible for processing complex and complicated legal documents should be appropriately trained to minimise errors. Furthermore, the Commission believes that dealing in property rights should be permitted. The existence of bilateral agreements may hinder the creation of an efficient market and the more efficient functioning of resource auctions with the least cost explorer/miner outbidding higher cost explorers/miners.

Size and shape of lease

As has been noted earlier, the boundary of leases are explicitly specified in mining acts. Generally the shape and size of leases conform to some geometric dimensions, not to geographic features.

While this geometric rule may not be as much of an impediment with regard to exploration, it could be a major problem with regard to mining. Mining leases should conform to the deposit shape and not some fixed geometric dimensions that may cut half of the deposit off. This will also enable all of the ore to be extracted by one lease holder and hence minimise the need for additional infrastructure. New legislation in Queensland allows this to happen. This view of leases fitting the deposit shape was also expressed by AMEC (sub. 15, p.64). "It must ... be recognised that the shape of a mining lease should basically conform to the shape of an orebody - not some fixed dimensions."

Work conditions

In most of the leases that are granted to exploration and mining companies, expenditure or labour conditions are attached to the lease. This is an effort by the government to ensure the company works the lease.

The problem with this system lies in that most mining projects expenditure is undertaken in an uneven manner. Large capital outlays are incurred at some stages of the mine development, while at other times less expenditure is occurred yet mine development is still proceeding. At other situations the market or economic climate (eg interest rates) may indicate to the company that development should be delayed. The imposition by the government of work conditions be they labour, expenditure or even stage completion conditions, force companies to proceed at a rate determined by neither the market nor themselves.

The Commission recommends that labour, expenditure or stage completion conditions that are placed on lease agreements be relaxed. If there was a market for titles (see above) then a company would be able to sell the title if another company offered them an acceptable price - thus this eliminates the problem of hoarding titles as the foregone revenue (opportunity cost) of not selling the titles would be too great.

Security deposits

Concern for the environment is becoming more and more prominent in land use decisions. Rehabilitation of the mine site after the completion of mining was one area of concern of environmentalists. Security deposits are a way to ensure that rehabilitation of the mine site occurs after mining is complete. Security deposits, or performance bonds as they are also known, are deposits that are lodged with the government at the request of the Minister, by the mining company, to ensure that rehabilitation work is carried out by the mining company (see section 7B for details). In having the mining companies lodge these deposits at the commencement of their lease the government ensures that rehabilitation work can be carried out even if the mining company becomes bankrupt. Security deposits currently operate in most states.

The Commission believes that security deposits are a good way to ensure that rehabilitation work is carried out by mining companies. However, in some cases, as has happened in North Queensland with some smaller alluvial miners, the security bond has not been large enough to create the right incentive. This has meant that the least cost option has been to forfeit the deposit lodged with the government instead of undertaking rehabilitation work. The Commission believes that security deposits should be made large enough so that it is in the mining company's interest to rehabilitate the land and have their deposit returned ie. that the size of the security deposit should exceed the cost of 'proper' rehabilitation by a substantial amount.

12.4 Conclusions

State Governments' mining and minerals processing activities legislation represents a major impediment to the mining and minerals processing industries' efficiency and growth. Of particular concern is the way in which mining legislation chaotically interacts with other legislation (eg planning and environmental legislation). The lack of co-ordination between government departments or the lack of integration of legislation results in drawn-out and inefficient approval procedures which impose substantial costs via delays, and uncertainty to the industry. State Agreements Acts should be increasingly implemented so that confusion and delays are minimised.

Problems also exist with the State Mining Acts themselves. The lack of consistency between States, reliance on outdated concepts, and considerable scope for administrative discretion all impose costs which could be avoided. Certain provisions in these Acts also have the potential to distort efficient resource allocation such as those dealing with the shape of mining leases, the inability to trade leases between high cost and low cost companies and prescriptive work conditions.

While some States such as South Australia and Queensland have addressed some of these problems, there is a need for other States to do a lot more. An urgent requirement is to streamline administrative practices in order to speed up approval procedures without compromising other concerns (eg environmental impacts). 'One-stop shopping' where a single government department (eg the Mines Department) is responsible (and accountable for) co-ordinating approvals from other departments appears a promising solution. Reviews of mining acts that have occurred in some States that limit the scope for administrative discretion and incorporate current advances in

technology should occur in other States. Following along the lines of limiting administrative discretion, approval applications should be actioned within a set time frame so that applicants are not left in 'limbo'. Some form of co-ordinated review to promote, as far as is possible, consistency between State mining legislation is needed so that any inefficiencies caused by confusion or extra administration due to inconsistencies between the States is removed.

REFERENCES

Hayes, B.R.M. 1988, 'Changing Environmental Controls over the Mining Industry in Australia', in AMPLA, Melbourne.

PART IV

TAXATION AND ROYALTIES

TAXATION AND ROYALTIES

Mining and minerals processing industries are subject, like most other economic activities, to a wide range of taxes. Section 13 assesses whether the structure of direct and indirect taxation of mining and minerals processing advantages or disadvantages the resources sector relative to other areas of the economy.

Examples of taxation and similar imposts which disadvantage mining are tariffs and other forms of assistance to manufacturing activities, limited deductibility of rehabilitation and plant demolition expenses, the restrictive definition of exploration expenditure adopted for tax purpose and Local government land rates calculated on the basis of mine outputs.

On the other hand, concessions on Fringe Benefit Tax liability advantages mining, while more extensive deductions for capital expenditures and shorter depreciation periods than are generally available to other industries can also represent favour treatment.

However, special concession should not in general be extended to a particular activity in order to compensate for other unfavourable arrangements. Rather, government policies should be directed at ensuring as far as possible that each tax instrument is economically efficiency, and consistent with other criteria relevant to taxation – such as equity concerns and costs of administration.

Section 14 discusses royalties. Royalties are not a tax but rather should be viewed as a charge for the transfer of mineral rights from government to private hands. Ideally, the charge should reflex the (net) value of the relevant mineral deposit(or economic rent). Other parts of this report identify ways in which available economic rents are dissipated or appropriated by others, rather than accruing to governments acting on behalf of the community at large.

Alternate royalty arrangements, which are dominated by output royalties, are inefficient. Although no one royalty system ranks best on all criteria, the Commission is convinced that the potential gains from adopting more effective rent-based royalties should be pursued.

13 TAXATION

Like most economic activities, mining and minerals processing industries in Australia are subject to a variety of direct and indirect taxes - some of which are unique to activities under reference in this inquiry. Some taxes advantage mining and minerals processing industries relative to other areas of the economy, while others place these industries at a disadvantage. Distortionary taxes should be eliminated in order to provide appropriate signals to make efficient investment and operational decisions.

Examples of direct taxes to which activities under reference in this inquiry are subject include company tax, fringe benefits tax, capital gains tax, and payroll tax, while examples of indirect taxes affecting these industries include duties on imported machinery and equipment, sales tax and fuel excise. (This section does not cover mining charges such as fees and rents on leases nor export duties.)

Taxes are necessary since all governments need to finance their spending programs (eg on the social welfare system). The issue for this reference is whether the structure of taxes advantages or disadvantages mining and mineral processing relative to other activities. If the existing structure of taxes is not 'neutral' between industries then this raises the issue of how the tax system could be changed so that it has minimal impact on the behaviour of economic entities (including, for example, the investment and operational decisions made by mining companies compared with other companies in the private sector). In general, it would be best to make each tax neutral, rather than attempt to compensate mining for disincentives caused by one tax (for example tariff and other assistance to manufacturing activities) by establishing incentives for mining under another tax (for example accelerated depreciation).

All taxes have differential impacts upon activities, sometimes because of differences in input intensities (eg payroll tax impacts most heavily upon labour-intensive activities), but also because tax parameters (such as the tax rate and tax base) differ between activities.

This section analyses the latter cases from the perspective of mining activities. It therefore excludes taxes where the parameters are the same for mining as for other taxpayers, despite the potential for differential impacts - for example, payroll tax for open-cut mines compared with more labour intensive underground mines.

Similarly, it does not consider some general tax issues raised by participants which would affect all classes of taxpayers, such as the substitution of a consumption tax for the existing system of indirect (and possibly some direct) taxes, the incentive for debt versus equity finance, the impact of inflation and historical cost depreciation on capital intensive industries, and the impact of recent changes in the payment period for company tax liability and PAYE deductions.

13.1 Company tax

In common with a limited number of other activities (including primary production, life insurance, and superannuation) there are explicit provisions within *the Income Tax Assessment Act 1936* (the Income Tax Act) dealing with aspects of mining operations. These are Divisions 10 and 10AAA (concerning capital expenditure deductibility, including Section 122J dealing with exploration expenditure) and Section 23(o) - within Division 1 - dealing with taxation of gold income). The impact of these provisions on mining activities compared with the treatment generally of other activities is assessed below.

In addition, the deductibility of expenditures such as rehabilitation, demolition of plant and feasibility studies is discussed. Several participants argued that these expenses should be deductible, while also indicating that the current tax legislation either does not allow them as a deduction or else is confusing regarding eligibility.

At the outset it is important to note a couple of features of the tax system. Generally, current expenditures necessary to earn income are tax deductible in full in the year in which the expenditure is incurred, while expenditure of a capital nature is not deductible except for depreciation for certain types of expenditure (mainly on plant, equipment and buildings). Second, since the purpose of the company tax system is to raise revenue it is to be expected that not every dollar outlaid by a business will be allowed as a tax deduction. The trick is to raise adequate revenue without adversely affecting business incentive more than necessary and to avoid uncertainty and inconsistency in the tax laws.

Deductibility of capital expenditure

Divisions 10 and 10AAA allow mining activities to deduct certain capital expenditures rather than use the normally available depreciation provisions elsewhere in the Act for plant, equipment and buildings. The claiming periods under these Divisions also differ from the general depreciation provisions.

Categories of expenditure covered by Division 10 include site preparation, certain buildings (including housing and storage facilities), water, light and power facilities (including contributions to State Governments for such provision), plant for exploration 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 was incurred.

Division 10AAA relates to capital expenditure incurred in transporting minerals and petroleum in Australia. Excluded from eligibility is expenditure on railway rolling stock, road vehicles, ships, wharfs, jetties and loading equipment for which normal depreciation provisions apply. Nor does it apply to 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, rather, it applies more generally to operators of mineral transport infrastructure. Further, the taxpayer incurring the expenditure does not have to own the facility.

Do Divisions 10 and 10AAA advantage or disadvantage mining relative to other activities? The answer requires a judgment as to whether the list of capital expenditures deductible by mining activities is more or less generous than for other activities and further, whether the deductibility periods for mining capital expenditures are more or less favourable than the general depreciation provisions.

Treatment of similar expenditures

CRA Ltd argued (sub. 73, pp.52-3) that depreciation of all capital expenditure should be available to all industries because such expenditure contributes to revenue earning just as expenditure of a revenue nature does - the only difference being that capital expenditure has an enduring benefit beyond the tax period it is incurred (and therefore should be depreciated over its economic life rather than fully deductible like operating expenditure). However, to the extent that capital expenditure deductibility does not apply uniformly to all activities (or that the write-off period is quicker for mining) CRA concede that mining may be advantaged relative to other activities.

The list of capital expenditures deductible by mining activities is, unarguably, more extensive than for most industries but only because many of the eligible expenditures for mining are rarely incurred by other activities. However, to the extent that non-mining activities may sometimes incur expenses for site preparation, for structures which are not 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 normally permitted, this would constitute favourable treatment of mining activities (which can claim for such expenditure).

Preferential treatment may also arise if there are categories of capital expenditure unique to other activities which are not deductible while expenditures unique to mining are deductible. However, there is no clear evidence that this occurs.

While there may or may not be preferential treatment of mining activities because of more extensive capital expenditure deductibility, several participants indicated that there may be distortions within the mining industry because of anomalous treatment of mining expenditures. For example, it was noted that housing and welfare facilities are claimable if near the minesite but not if located near a port, and there were claims that site preparation expenditure is allowable but site demolition expenses are not.

The IAC (1976) recommended "allowable capital expenditure be extended to cover expenditure on ports and related facilities, including housing and welfare facilities located at the port site." Since that time various port-related expenditures have been included in the deductibility provisions, but not housing and welfare facilities.

The main difference between housing facilities at the minesite and similar structures at the port would appear to be the potential for port-located housing to have a much longer effective life. But this suggests that the deductibility periods should differ between the locations rather than the eligibility. Both forms of expenditure are necessary for a company to conduct its mining operations (and transport of product) and for neutrality both forms of expenditure should be deductible.

By making port-located housing and welfare facilities more expensive than those located at a minesite or fly-in-fly-out arrangements, the current taxation treatment may be counter productive in the sense that it cuts across State government goals of regional growth. Also, future mining operations in the region (after the mine which led to a town being built has ceased operations) would probably have more use for facilities located at the regional port rather than inland near the defunct mine.

A further aspect of the deductibility of housing and welfare facilities is that even if the facilities are located at a minesite, the cost is not tax deductible if the facilities are for employees of a processing plant not owned by the mine company. This may be a disincentive to establishing the most appropriate industry structure - such as, encouraging vertical integration when this is not the most efficient arrangement.

The Commission recommends that expenditures on housing and welfare related to mining and mineral processing operations be deductible for company tax purposes if they occur in regions where Zone Rebates apply.

Participants' concerns about the exclusion of demolition costs from Division 10 (while site preparation costs are eligible) are discussed below, along with the treatment of rehabilitation and other mine closure expenses.

Comparing depreciation allowances

Do the deductibility periods used for mining capital expenditure under Divisions 10 and 10AAA provide neutral treatment compared with the general depreciation methods used for plant, equipment and buildings?

The depreciation periods for plant, equipment and buildings depreciated under the general provisions range up to 40 years. Therefore, for neutrality similar assets employed in mining and non-mining activities should be depreciated over the same period unless the life of the mine is shorter than the economic (tax) life. In this latter case the (lesser) minelife determines the economic life of a mine-related capital asset. As the Australian Mining Industry Council stated (AMIC, sub. 29, p.85):

The position of the mining industry is distinguishable from that of other industries since its reserves of raw materials are depletable. As a mine is worked, the mineral deposit approaches exhaustion and there is generally a corresponding diminution in the value of assets associated with the mine. This is particularly the case since a large part of the mining industry is located in remote areas where there is only limited scope for asset sales to another activity. Many capital assets are scrapped with mine closure. This differs substantially from the manufacturing and services sector where buildings, for example, can be sold if a company ceases operation.

The life of a mine used for depreciating assets is estimated by the mine developer and used for tax purposes unless the Commissioner of Taxation objects. The estimate of the mine life can be changed each tax year on the basis of more information. Capital expenditure during a year is depreciated over the (updated) minelife while the written down value of capital expenditure of prior years is apportioned over the new remaining mine life.

There is no concessional treatment for mining activities when the estimated minelife is shorter than ten years even if the mine life subsequently proves to be longer. At the time an investment decision is made it is with reference to the best available estimate of the mine life. While subsequently the tax life may prove to be different from the one on which the investment was made, this is an unexpected difference which may either be advantageous or disadvantageous. This same situation arises when the estimated economic life upon which investment decisions are made for capital assets in other activities turns out to be greater or less than in practice.

However, the option of writing off capital expenditure over 10 years (under Division 10) or 20 years (under Division 10AAA) when the minelife is estimated to be greater will be concessional if similar assets in other activities are depreciated over longer periods. Faster depreciation represents assistance because it is equivalent to an interest free loan. Under the assumption that mining capital expenditure is deducted over 10 years rather than an average of 20 years in other activities, CRA estimate (sub. 73, p.53) that in 1987-88 the 'extra' deduction from depreciating capital expenditure faster than in non-mining activities was about \$35 million and that therefore the tax deferred was about \$13.6 million (0.39 times \$35 million).

Many participants argued for the reintroduction of accelerated depreciation and other capital expenditure incentives on the basis that there is a need to compensate for biases against mining activity (such as tariffs for manufacturing) and to generally compensate all activities for the adverse effects on capital investments of inflation. The Commonwealth Government abolished many such provisions in 1988. To provide them for one activity and not another clearly distorts the efficient pattern of resource use. Tariff compensation for mining activities alone is also not a justifiable basis for such proposals. This problem is best addressed directly within the tariff system rather than by introducing an indirect solution (see Section 13.5). With regard to investment incentives generally to counter imperfections in the tax system, the same argument about using direct solutions (if they are warranted) applies. That is, the source of the problem is the tax system.

Deductibility of exploration expenditure

Exploration expenditure is an expense unique to mining activities. Under Section 122J a full deduction is allowed for calculating assessable income.

The Australian Bureau of Agricultural and Resource Economics (ABARE, sub. 161, p.19) treats all claims under 122J as assistance because it permits immediate deductibility rather than amortisation of expenditure. The ABARE view is that successful exploration produces a productive asset and therefore is expenditure of a capital nature to be depreciated over time. The effect of treating this provision as assistance raises ABARE's (p.19) estimated effective rate of assistance for the mining sector in 1987-88 by 0.31 per cent.

Participants argued against the view that full deductibility was assistance on a number of grounds. First, CRA (sub. 73, p.52) described exploration as analogous to R&D: "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." By this reasoning the 150 per cent tax deduction (and other R&D assistance schemes) currently available to non-mining activities discriminates against mining.

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 expenditure 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 at some time or use the group loss transfer provisions. In many cases assessable income will not eventuate because the exploration proves unsuccessful and similarly many exploration companies are not part of a 'group' (as defined in the legislation).

While it is true that successful exploration expenditure is of a capital nature (except for specialist exploration companies), if deductibility of unsuccessful exploration expenditure was not permitted then the low probability of success in exploration may distort investment decisions. As AMIC commented (sub. 29, p.84):

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.

The Commission concludes that although immediate deductibility of exploration expenditure may involve an element of assistance, this 'concession' is the least distorting tax treatment in terms of the efficient allocation of resources.

Of 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.

Restricting deductible exploration expenditure to that incurred on the tenement fails to recognise the total investment directed at establishing a viable mining operation. "There are companies exploring in Australia who have an excellent track record in finding new mines. This success is generally as a result of decisions made to take risks and support ideas thought up by geological and geophysical staff whose whole life is spent searching for new exploration targets." (N. Byrne and Associates, sub. 62, p.4).

It is important to note that the concurrent legislation for petroleum activities (Section 124AH) does not restrict deductibility of exploration expenditure to on tenement. Presumably this reflects the fact that petroleum basins cover huge areas encompassing many leases and therefore discoveries could be made off lease which result in a viable project on lease. Regardless of whether this scenario is more likely or not for petroleum than minerals, all exploration investments should be eligible for deduction.

If expenditure not undertaken on the tenement is deductible there would be an increase in the degree of discretion in the tax system because of the scope for allocating head office and laboratory expenditure over different leases.

In deciding where to draw the boundary line for eligible exploration expenditure the guiding principle should be: does the expenditure contribute to earning assessable income? As the intent of all private exploration activity is to contribute to a viable mining operation, the existing eligibility appears restrictive. Further, it appears inconsistent that unsuccessful on-tenement exploration expenditure can be deducted against income from other sources or transferred within a group while successful off-tenement exploration expenditure is not deductible.

The Commission recommends that the definition of eligible exploration expenditure in Section 122J be broadened to include all (contributory) exploration expenditure incurred in Australia.

Extending the principle of contributory expenditure to the limit, BHP (sub. 67, p.12) maintained that "overseas exploration and development expenditure should be an allowable tax deduction". At present, overseas exploration expenditure can only be deducted if there is income from the overseas project taxable in Australia and is only deductible against that income. (The broader arrangement for expenditure within Australia is to match expenditure against taxable income from any mining tenement, other sources or 'group' income).

The issue of overseas expenditure raises the wider issue of double taxation agreements with other countries - for all activities and not just mining - and the Commission has not addressed this matter as part of this inquiry. The Shell Company of Australia (Shell, sub. 251, p.13) expressed disappointment that the Commission did not recommend on this issue in the Draft Report. Shell concentrates its worldwide R&D effort into a small number of centres, rather than within every country in which it operates and therefore requested that the share of this R&D expenditure attributable to its Australian operations should qualify for the 150 per cent deduction for many domestic research programs.

Despite Shell's plea the Commission will not recommend on this matter at this time.

The treatment of rehabilitation and other expenditure

There was widespread concern among participants about the deductibility of certain categories of expenditure for example those in respect of rehabilitation, demolition, feasibility studies, environmental impact statements, and tailings dams. These concerns related to both uncertainty as to tax treatment or that a tax deduction was not permitted.

The uncertainty of tax legislation was described by Pasminco (sub. 89, p.60) in the following terms: "the Act is an extremely complex imprecise piece of legislation which in our view requires a sustained review." MIM Holdings Ltd (sub. 19, p.36) echoed this view by stating that "the overly complex and unwieldy tax laws should be simplified. The cost of tax administration is constantly rising."

The adverse effect on business planning and risk taking of uncertainty in interpreting the tax laws is regarded by the Commission as a serious problem. In many cases deductibility relies upon interpretation of general provisions rather than hard and fast rules for particular cases. Greater certainty would be facilitated either by amending the tax legislation to state explicitly the deductibility or otherwise of 'modern' day expenses such as rehabilitation or by the ATO issuing draft rulings which give clear guidance for taxpayers.

With regard to not permitting certain expenditures to be tax deductible (or eligible for depreciation) this can always arise since the changes in the tax laws lag rapid changes in technology. On this point the Association of Mining and Exploration Companies (AMEC, sub. 15, p.86) stated:

Many of the problems being experienced by Mineral Exploration and Mining Companies in respect of Taxation matters have their genesis in the fact that the Act is now so hopelessly outdated it cannot accommodate the practices employed in the modern Mining Industry, nor meet the standards required in modern commerce.

Therefore, certain expenditures may be non-deductible, not because of overt government policy, but because the importance of the particular expenditure has only recently arisen and there may be a lag in announcing policy after concerns have been expressed by companies. For example, the Treasurer announced in the 1990-91 Budget the Government's intention to allow deductibility of minesite rehabilitation expenses (which, also covers demolition of old plant).

Rehabilitation expenses

The Budget announcement indicated that minesite rehabilitation expenses would be tax deductible by allowing a full deduction in the year in which it is incurred. The Commission agrees with this intention but believes it does not go far enough. If rehabilitation is undertaken after cessation of production, there would often be insufficient income against which to claim a deduction (and group loss transfer may be unavailable to many operations). Although it can be argued that because of such an arrangement companies will (and do) progressively rehabilitate to minimise the amount of undeductible expenditure, there will always be some amount of post production clean-up (and there remains the possibility that rehabilitation expenditure unforeseen by the company may be required by governments at the end of mining).

There are a number of ways in which rehabilitation expenditure can be deducted so that there is no advantage/disadvantage as to when it is incurred. First, carry-back could be permitted in a similar way to which carry-forward of general losses is used. Determining the period of carry-back involves a trade-off between increased administration costs of longer periods against the inability of companies to deduct the expenditure fully if the period is too short. The IAC (1976)

recommended that seven years would be an appropriate period, as until recently this was the period permitted for carry-forward of tax losses and is the statutory period for which necessary tax records must be available. Seven years should also be sufficient in many cases to allow much of the deduction to be utilised by the company.

As a second way of deducting rehabilitation expenses, AMIC proposed (sub. 29, p.91) "[allowing] a portion of the estimated total cost of site rehabilitation to be deducted against assessable income of a mining operation in each year in which the mining operations are conducted." Annual provisions are used for many future liabilities (for example long service leave expenses) to calculate company profit, and auditing procedures check that they are reasonably based. (For tax profit only actual expenses are deducted). In principle a provisions approach sounds reasonable but the lack of experience with rehabilitation expenses and the difficulty in forecasting them may introduce too much discretion into the tax system.

The cost of auditing (to police the discretion) could be reduced by allowing a set amount per unit to be deductible (as for motor vehicle expenditure). For example, allowing an annual deduction of say \$15 000 per hectare divided by the estimated mine life. However, the cost of rehabilitation varies markedly between different environments, types of mining operations, as environmental technology quickly evolves and as rehabilitation standards are changed.

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 for future liability). The Commission recommends that carry-back of rehabilitation expenditure be permitted for an appropriate period if there is insufficient income to claim a deduction after mining ceases. The treatment of rehabilitation expenditure should be the same for all activities.

Since carry-back is not used as part of the tax system, there may be some concern that such a change may bring pressure to use carry-back generally. However, there are some distinguishing aspects in the case of rehabilitation expenses. The Commission is not recommending carry-back of general losses but carry-back of rehabilitation expenses. Even if it were interpreted that carry-back for rehabilitation expenses was discriminatory against other expenses, this must be weighed against the benefit to society of encouraging environment enhancing activity. There is also a subtle difference between losses at termination of business and losses which can be carried forward against future operations. And although termination losses are not unique to mining, it may be that rehabilitation expenses are more likely to contribute to an unexpected termination loss (all the more so as they seem to be subject to ever changing community standards).

Plant demolition

Plant demolition expenses are included as part of the Commonwealth government's announcement (see above) about the deductibility of minesite rehabilitation expenses. This is admirable, for demolishing old plant is clearly rehabilitation of the environment. The deductibility also corrects the inconsistency that demolition expenses may not have been deductible unlike site preparation expenses are (under Division 10). The Commission recommends that carry-back of plant demolition expenses concurred after mining operations have ceased be permitted for an appropriate period.

A further category of demolition costs not deductible was highlighted by Pasminco (sub. 259). When old plant is replaced, which is the costs of demolition are not tax deductible. The written down value of the old plant is a deduction (adjusted for any disposal value) and the cost of the new plant (including installation) becomes depreciable. But the cost of dismantling the old plant is not deductible (except to the extent that internal labour is used and is included in wage expenses).

From an economic point of view it may seem wrong not to allow all business expenses to be deducted as either an operating expense or as depreciation of the capital value. However, the tax system has many inconsistencies with an economic approach. In the case of this category of demolition costs no deduction is available because the expenditure is not linked, in the manner required by the tax legislation, to the creation of a capital asset nor the earning of assessable income. Although a similar link may not apply for all deductions available within the tax system, the Commission has not analysed this issue as part of this inquiry and therefore, makes no recommendation about this particular category of demolition expenses .

Feasibility studies

The deductibility of feasibility studies raises fundamental issues about the tax deductibility of expenses that are incurred in the creation of an asset. Under existing tax legislation most expenditure of a capital nature is not deductible and normally feasibility studies would not qualify.

Feasibility expenditure is a broad term ranging from activities such as test drilling, sample crushing, the cost of pilot plant and assaying (which are akin to exploration and prospecting) to surveys of ports and the economics of processing activities.

The Commission recommends that expenditures on feasibility studies which are essentially exploration related be deductible under section 122J. (If 122J was to be repealed on the basis that exploration expenditure is of a capital nature - see earlier section - then feasibility expenditure should be similarly treated.) Studies of infrastructure outside the mine tenement and proposed expansions of existing mines would not qualify as exploration expenditure.

The eligibility for deduction of feasibility studies which are clearly of a capital nature (such as for processing activities) should not be changed without a broader study of the deductibility of expenditure of a capital nature.

Environmental impact statements

Like feasibility studies, EIS expenditure would appear to be a capital expense. The issue is then whether it can have an 'exploration expenditure' interpretation and/or should it be eligible for depreciation like certain other capital costs (such as acquisition cost of plant, delivery costs, installation costs, customs duty).

The Commission considers that EIS are not part of exploration expenditure as they relate to broader social aspects of mining and not the basic proving up of reserves. However, it does believe that EIS expenditure should be eligible for depreciation especially since the costs and requirements of EIS are more severe and drawn out than a proponent might reasonably expect at the feasibility stage (see Section 9). Tax depreciation for EIS could encourage higher quality EIS to be prepared thereby giving the community better information to make development approval decisions.

Tailings dams

The cost of construction of tailings dams is not deductible under Division 10 because it is not related to the winning or treatment of ores. However, it is eligible for depreciation as a structure under the general depreciation provisions regardless of whether it was constructed from cement or is earthen walled. The Commission agrees with this treatment. (The desire by some participants to deduct the cost of tailings dams under Division 10 rather than the general provisions is perhaps an indication of some concessional treatment for mining activities of Division 10 - see earlier discussion).

Taxation of gold income

The taxation of gold income from the 1 January 1991 is a fait accompli. However, while this justifiably establishes equality of tax treatment between gold income and income from most other activities, some participants were concerned that the transition arrangements - Division 16H - do not provide for the same matching of expenses against income as for other activities, particularly mining. In the opinion of AMEC (sub. 15, p.109-10):

While it was the Treasurer's desire to provide a 'level playing field', a repeal carried out in this fashion produces significant commercial distortions in the gold mining industry's business activities and does not produce a reasonable transition mode for the industry from exempt to fully taxable status.

and further,

While the time span permits miners to arrange their affairs to protect some part of their 1990-91 revenue from income tax, it is reasonable to say that income is being retrospectively taxed.

The intention to tax gold income was announced in the May 1988 Economic Statement and the repeal of existing exemption provisions was made by the Taxation Laws Amendment Bill (No. 5) 1988. Because there was a period between the announcement date and active date, the Bill also legislated transitional arrangements to allow:

- 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;
- 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.

The calculation of notional deductions so as to establish residual values available for actual deduction after 1 January 1991 was criticised for a number of features. For example, Placer (sub. 88, p.10) observed:

The notional deductions must be calculated and deducted even though the mine is not generating any income, or has income which is less than the notional deductions. There is no carry forward of notional losses. This is stricter than that of general mining companies.

AMEC (sub. 15, p.112) discussed the use of a notional 10 year write-off period in the following:

Capital expenditure when incurred pre 25 May 1988 was incurred as far as the miner was concerned relative to the actual total life of the mine ... In longer life mines (i.e. over 10 years) the adopted formula will prevent the carry forward of expenditures for application against taxable period income that have true right of reflection against that income.

In relation to the transitional arrangements for exploration expenditure Western Mining Corporation (WMC, sub. 69, App.4) expressed two concerns:

... under present arrangements, only expenditure incurred between 25 (sic.) May 1988 and 1 January 1991 is allowable. This an artificial distinction which does not recognise the long lead times which frequently arise between commencement of exploration and the ultimate derivation of assessable income from an economic deposit.

and,

... at no time since the re-enactment of Division 10 of the Income Assessment Act in 1968 has there been any limitation to the carry forward of exploration expenses incurred by an mining company on exploration for minerals (other than gold). It is considered that the imposition of a restriction of seven years is completely unjustifiable.

In the opinion of participants the transitional arrangements for taxation of gold income are more restrictive than provisions applying generally to mining. The Commission is not well placed to ascertain whether this is the case or not. Since the announcement in May 1988 of the intention to tax gold income the industry has expressed various concerns to the Government and the ATO. In response to some of these industry concerns the ATO has indicated that legislation was prepared (or being prepared) regarding trading stock, life of mines, CGT and 'gold loans' aspects.

International comparisons

Several participants emphasised differences in taxation arrangements between Australia and other countries. The general feeling was that mining activities in other countries were more favourably treated than in Australia. These conclusions were usually reached by noting incentive arrangements in various countries either for mining or business in general and which were not available for mining investments in Australia.

While not arguing with the accuracy of these observations the comparisons are far from comprehensive. And more detailed studies are not necessarily a fruitful endeavour, for example, Carmon and Varon (1979, p.88) state:

Tabulations of types of taxes and rates on a country-by-country basis may appear impressive but actually, they are almost always misleading and incorrect. ... In many countries taxation law is so complicated that it constitutes a jungle in which it is very easy to get lost.

Even with a thorough tabulation of rates and provisions a legitimate comparison of 'effective rates of corporate taxation' of countries necessitates a quantitative study comparing tax liabilities for the same (hypothetical) project. The ranking of effective rates may then differ for different projects.

Notwithstanding a probable higher incidence of corporate taxation on mining activities in Australia than in some other countries, the effective tax rate is not the only determinant of the international flow of (mining) investment. For competing investments with similar pre-tax returns other factors will influence mining investments. For example, CRA emphasised (sub. 73, p.50) the importance of the stability of the tax laws. The political climate is one of a number of non-tax factors. Others would include the 'bureaucratic' process, land accessibility, the existing knowledge of the country's geology and the availability of skilled labour.

Finally, Australian tax policy (for mining in particular) should not be determined by other nations 'effective tax rates' especially if mining activities are favoured (at cost) in these other countries. Each nation's tax system is necessarily unique to its total social and economic requirements.

13.2 Fringe Benefit Tax (FBT)

FBT is payable by an employer on non-PAYE remunerations 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 in remote areas are eligible for a 50 per cent concession on FBT liability for area housing and travel, the mining industry argued on a number of grounds that no FBT should apply at all. For example, CRA (sub. 73, p.51) argued this because:

Prior to the introduction of FBT the industry provided low rental housing for its employees in remote areas. This was done with the knowledge and agreement of the Commissioner of Taxation and the rental was set at levels agreed with the Commissioner - rentals at less than the agreed levels resulted in tax being paid by the employee. Under the changed arrangements, the minimum rental amount was substantially increased and this is now liable for FBT ...

The WA Iron Ore Consultative Council argued (sub. 14A, p.6) for exempt status on the basis of there being adverse social effects if the mining companies did not provide low cost housing in remote areas. For example, if higher wages were paid in compensation and employees made their own housing arrangements, there would be a tendency towards poorer quality boom town construction with consequent undesirable social effects.

Also, with higher wages and employees organising cheaper housing arrangements 'target savings' objectives would be reached more quickly and labour turnover would increase. Companies would incur higher training costs in addition to attempting to attract labour to areas with existing low quality, poorly integrated housing.

Some participants suggested that higher compensatory wages may not even be an option. For example, AMIC (sub. 29, p.91) stated that "because of rigidities in the wage system, it may be difficult to pay the wage differentials needed to compensate for higher housing costs ...". If higher wages were paid in lieu of fringe benefits to maintain after-tax wages then, the cost to the company would be greater when the marginal tax rate of employees is higher than the (50 per cent rebate) FBT tax rate.

The WA Department of Resources (sub. 48, E3) was concerned that the FBT is encouraging new developments to use 'fly-in-fly-out' arrangements, thereby adversely affecting long-term state development. Without the establishment of an existing township "it will be difficult to encourage a stable population and growth of the town beyond the immediate needs of the company upon which it is reliant." Where fly-in-fly-out is used, the government has been encouraging the developer to base operations in existing regional centres to facilitate growth outside the Perth metropolis.

In cases where provision of a township had been 'forced' upon a company, the introduction of FBT would be a double blow. The WA Iron Ore Consultative Council (sub. 14A, p.5) noted that under *State Agreement Acts* iron ore producers were required to provide housing. ERA noted (sub. 57, p.52) it was left to complete the Jabiru township when the Jabiluka and Koongarra projects were forced to withdraw under prevailing government policy - "... it seems illogical that the Company then has to pay Fringe Benefit Tax after providing the only worker accommodation available in the region."

If a company is 'forced' to build a town or not - and it is not clear what constitutes 'forced' - it becomes a case of which is the lesser of two evils: to require FBT to be paid if the employer provides subsidised services or the potential for the company to use the exemption from FBT to meet future wage claims (by increasing the non-wage concession) and thereby undermining the PAYE system.

Finally, some participants argued against FBT for mining companies in remote areas 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 - that is, there are public authority operating deficits.

Under-recovery of transport and energy services in metropolitan regions by public authorities clearly falls outside the Fringe Benefit concept since they are not provided by an employer in lieu of wages. And any direct benefit to transport and energy users is dispersed in higher taxes (for all classes of taxpayer) to pay for the deficit financing or over-charging for other services (cross subsidisation). Public authorities are currently reforming their operations in the direction of user pays. In the meantime it is not appropriate to waive FBT on subsidised services in remote areas as a form of compensation.

The Commission agrees that a change to cash only packages which equalise existing after-tax remunerations would adversely affect mining companies because of higher labour turnover rates and higher wages under the progressive PAYE schedule. But this has always been the case - FBT or no FBT. In fact companies continue to provide some housing fringe benefits despite FBT liability, obviously because it is still better than the cash only alternative. Similarly, the Commission agrees that the FBT has increased the cost of providing 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 industries in remote areas 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 necessarily justify lower FBT liability for industries in remote areas.

The Commission recommends that full liability for FBT apply to benefits provided by mining companies (and other employers) in remote areas.

To the extent that the FBT concession aids decentralisation goals and helps to attract labour to remote regions, there are more transparent methods of achieving this. For example, generally available decentralisation grants and Income Tax Zone Rebates can be used depending upon the objective. These instruments would be more direct (efficient) and transparent instruments than a 50 per cent FBT concession.

Income Tax Zone Rebates were originally instituted to provide compensation for the adverse conditions and high costs of living in remote areas. They also recognise that people living in remote areas are provided with disproportionately fewer Commonwealth services than people living in the more developed areas of Australia.

The WA Department of Resources Development (sub. 90, Attachment) argued that because it costs about \$6615 per annum to live in a Zone A remote area than a metropolitan area the Income Tax Zone Rebate should be increased to \$2540 from \$870. While the Zone Rebate is not intended to fully compensate for cost differences between geographic areas, the level of the rebate could be varied to facilitate the flow of labour to remote areas.

13.3 Capital Gains Tax (CGT)

CGT is payable for certain capital assets disposed of at a profit, after allowing for inflation.

AMIC (sub. 29, p.88) stated that "there are a number of aspects of the Capital Gains Tax which result in non-neutral impact on the minerals industry because certain unique characteristics of the industry are not recognised. The two areas that are of particular concern are the treatment of farm-outs and the rollover provisions." The Commission has considered the treatment of farm-outs but not rollover provisions.

A farm-out is the assignment of a portion of an exploration or mining right to another party which agrees in return to undertake a specified (case by case) work program. Sometimes, but not usually,

there may be direct consideration received by the farmor. The purposes of farm-outs include: to spread risk over a number of areas, to obtain the technical expertise of another company, and to assist a project outside the farmor's financial capabilities.

The ATO issued Ruling IT 2378 to illustrate how farmouts are treated for income tax and capital gains tax purposes. Although noting the variety of possible circumstances and the need for case-by-case consideration, the Ruling asserts the general principle that a farm-out agreement constitutes a disposal of property by the farmor and, as such, would be liable to the capital gains tax provisions.

The Ruling provides the example in which one company (A) acquires the exploration rights over an area for \$30 000 and then enters into an agreement with another company (B) that, in exchange for a 40 per cent share in the property, company B will contribute half of the cost of an exploration program costing \$700 000 over the next 3 years. The value of the disposal by company A would be 40 per cent of the "market value" of the rights held prior to the agreement being entered into. The Ruling suggests that, in the particular "grass roots" example, the parties might submit a NIL valuation of these rights and that this would be likely to be accepted by the ATO. Ignoring the fact that the exploration expenditure is to be spread over a period of time (and is therefore worth less than \$700 000 in present value terms), the nature of the agreement appears clearly to reveal an existing "market value" of \$175 000. Thus the ATO's suggested preparedness to accept a NIL valuation would appear generous.

The mining industry might argue that company A has not, in fact, disposed of an asset at all: that company B does not acquire any part of the value of the original asset but, rather, acquires an asset which represents half of the value which is expected to be added to the original asset by the joint exploration program. Two polar cases can be considered. If company A had sold 40 per cent of the existing right to company B (for \$70 000) and then the two companies had contributed pro rata to the exploration program (with A contributing \$420 000 and B contributing \$280 000), the end result would be the same and the capital gains tax liability would be clear. On the other hand, if A had contracted for B to undertake exploration to the value of \$350 000, in conjunction with its own exploration team undertaking the same amount of exploration, and had simultaneously issued new shares to the value of \$350 000 all of which had been acquired by company B, the result would again be the same but there would be no capital gains tax implication.

It needs to be recognised that the application of a capital gains tax on a realisations basis, rather than on an accruals basis, necessarily involves a substantial measure of arbitrariness and inefficiency. To adopt the rule that taxpayers should be treated as if they had realised capital gains whenever this is possible and wherever reasonable valuations of those gains can be made seems to be a sensible compromise. In that sense, the Commission agrees with the ATO's position on the capital gains tax treatment of farm-outs. However, it notes that the problems of valuation are, in practice, likely to be quite serious. For example, suppose that company B agrees to drill one exploration hole at a cost of \$100 000 and, conditional upon obtaining specified results, subsequently to spend a further \$10 million on exploration, all in exchange for a 50 per cent share in the project. The value of the disposal by company A now depends entirely on an assessment of

the probability that B's first exploration drilling will provide results that trigger the subsequent exploration program. The companies involved must be able to assess this probability in order to enter into the agreement, but it is unlikely that the ATO will have any basis of fact on which to dispute whatever valuation that the companies choose to place on the original asset. It cannot be less than \$100 000 but it may well be in excess of \$1 million. As a result, capital gains tax on farmouts is likely to be levied on less than the full value of the assigned property.

13.4 Local government rates

Local government rates are levied on residents and activities within a jurisdiction to finance public services. The most common rating methods are unimproved land value (for domestic occupancies) and rental basis (sometimes used for business property). However, the rating method for mining leases often diverges from this structure. In particular participants were critical of the NSW system.

Section 153 of the NSW Local Government Act provides for three methods of valuation of land occupied by mining operations - land value, rental value and output determined - at the discretion of the council. For non-coal minerals the output method is based on 20 per cent of the average saleable value of ore of the preceding three years (but shall not exceed \$0.02 in the dollar upon the land value). For coal operations the output method allows councils to charge up to 7 per cent of the value determined by applying \$3 per tonne to the preceding year's production volume.

The rates payable under alternate valuation methods can be startlingly different. For example, the NSW Chamber of Mines notes (sub. 37, p.14) that a particular mine paid \$758 in 1988 under the land value method but \$46 043 in 1989 under the output method! The hike in valuation bases under the output method may also bring many NSW mines within the scope of land tax which begins for valuations over \$135 000.

Oakbridge Ltd described (sub. 32, p.16) the output valuation method (for coal) as another form of rent seeking activity additional to "that practiced by coal mining unions, and state authorities such as the SRA [State Rail Authority (of NSW)] and MSB [Maritime Services Board (of NSW)]." Similarly, the New South Wales Coal Association (sub. 45, p.31) stated that it is "in effect, a resource tax and allows local government to enter the tax domain of State and Federal Governments."

Use of the output valuation method and the arguments against it are not recent. The NSW Chamber of Mines (sub. 37, p.15) quoted from the report of the 1965 Royal Commission on Rating, Valuation and Local Government Finance (chaired by the Hon. Mr. Justice R. Else-Mitchell):

... it is quite impossible to regard a valuation based on output as an equitable basis for the rating of a mine when all other taxpayers are rated on the unimproved value of their lands. If rates were to be levied on improved or annual values, output would have some relevance to the valuation to be used for rating purposes but not otherwise. But where rates are levied on unimproved values, there is no more justification for rating a mine on output than for rating a retail shop on sales turnover or a factory on volume of production - indeed there is less, because mining operations cannot continue after the mineral deposits are exhausted ...

Of more recent concern to the (coal) industry has been the change in the output valuation factor. Up until 1990, the output method for coal mines was based on a factor of \$0.75 per tonne but this was increased to \$3 per tonne following amendments to the NSW Local Government Act. Although there is scope for councils to levy at a lower rate than the maximum 7 per cent so as to cushion the sudden increase, a NSW Coal Association (sub. 45, p.31) survey found only one shire used less than the maximum rate and "overall increases in rates in 1990 to be paid by the coal industry was 56 per cent." However this average masks cases such as the Newcastle Wallsend Coal Company's Pelton/Ellalong colliery which paid \$246 740 in 1990 compared to an average \$51 752 for the previous five years - a 376 per cent increase!

Although local councils may incur substantial costs because of mine operations in their jurisdiction (such as road related expenses and power lines), the output valuation method is a less direct and efficient method than direct billing or negotiated (up front) contribution for infrastructure and services (see Section 15). And when combined infrastructure contributions, council rates and similar imposts exceed the attributable costs of mines, it is 'double dipping'.

The Commission recommends that local government rates based on mining output be abolished. (The reform process will most likely need to be linked to appropriate policies for mining company contributions for infrastructure and financial relations between local councils and the other levels of government.)

13.5 Tariffs and other indirect taxes

Mining and minerals processing activities are penalised by taxes on inputs such as tariffs on materials and capital equipment, excise on fuel, and sales tax. Many other activities are also indirectly taxed under these arrangements. The relative impact of these taxes on mining and minerals processing activities compared with other activities is summarised in estimates of the effective rate of assistance (see Volume 2, Appendix H and ABARE 1990).

Tariffs

Tariffs (and other border assistance) for manufacturing and agricultural products penalise mining and minerals processing activities by inflating the cost of material inputs and making it more difficult to attract labour and capital. If tariffs were removed it would be expected that mining and mineral processing activities would expand relative to other sectors of the economy. Simulations with the ORANI model (see Volume 2, Appendix F) of the effects of removing assistance to agricultural, manufacturing and mining activities showed an increase in mining and minerals processing output.

Tariffs impact differently on the range of mining and minerals processing industries. This largely explains the variation in the estimated effective rates of assistance for the activities under reference (Appendix H, Volume 2). The Tasmanian Government (sub. 81, p.30) expressed concern that the mining and minerals processing activities most penalised by the structure of tariffs (those with the lowest effective rates) were generally the more important industries within Tasmania.

As announced in the May 1988 Economic Statement most tariffs are being phased down to a maximum of 15 per cent by July 1992. This will have the effect of narrowing the disparity in effective rates of assistance between the broad sectors of the economy - agriculture, mining, manufacturing and service. The Commission recommends that the Commonwealth Government continue its program of progressive reductions in tariffs beyond 1992.

Participants also commented that the Commercial Tariff Concession System (which enables duty free entry of imported materials and equipment for which there is no competing domestic supply) is too restrictive and should be relaxed to allow greater duty free entry of mining inputs. The Commission has not considered these arrangements as part of this reference but notes that it has a separate inquiry into the CTCS. The final report from that inquiry is due on 8 March 1991.

A further aspect of tariffs (and excises) which participants considered could be improved and which would benefit mining and minerals processing was to extend duty drawback to materials consumed in the production process. Currently, duty drawback is only eligible on imported inputs not physically exhausted in the production of goods for export. Therefore there is no drawback of excise on imported fuel.

The Commission has not considered the wider ramifications to all industries of changes in the drawback arrangements as part of this inquiry and therefore the Commission will not recommend on this issue at this time.

Fuel excise

Energy inputs represent on average a greater share of mining and minerals processing operating costs than for most other activities in the economy (see Section 18). Thus, fuel excise probably impacts more heavily on mining activity than for most industries. Although a rebate of tax is available for off-road use, ABARE (1990) estimated for the 1987-88 effective rate calculations that the excise paid on fuel inputs by the mining sector exceeded rebates by \$31.65 million. This is about 10 per cent of the cost impost represented by tariffs.

WMC (sub. 69, p.42) commented on the impact of fuel excise on the competitiveness of its operations:

The major input tax with which WMC is concerned is the excise paid on various fuels. This tax and more especially, the way in which it is indexed, contributes insidiously to reducing competitiveness.

In WMC's case, the introduction of excise on fuel oil contributed to a shift to alternative energy sources [natural gas] at the Kwinana Nickel Refinery after it was introduced in the 1983-84 Budget. No rebates are available, as is the case with diesel in some (limited) uses.

However, ... alternative energy sources are becoming increasingly expensive and threaten the competitiveness of the refinery. Meanwhile the effect of indexation has effectively precluded any return to fuel oils, meaning that the company has little ability to spur efficiency and lower costs in the supply of gas through the threat of turning to a substitute.

The Commission has not considered the issue of fuel excise as part of this reference. It previously reported on this matter in IAC (1986).

Sales tax

Certain items of plant and equipment used within the mining sector are exempt from sales tax. Some companies requested that exemptions be extended to other items such as office computers or for mining activities such as processing which do not currently qualify for the concession.

The Commission has not made any detailed study of the effects of the sales tax system on mining and minerals processing activities as part of this inquiry. As indicated earlier, the sales tax issue extends well beyond the activities under reference in this inquiry and the Commission does not intend to make a recommendation in this area.

13.6 Conclusions

A number of taxation arrangements give inappropriate signals to efficient investment decisions by mining companies. The Commission has recommended ways in which various taxation arrangements can be restructured to give more appropriate signals.

Taxation arrangements identified as disadvantaging mining activities relative to other activities were tariffs on inputs, limited deductibility for company tax of mining-related expenses such as exploration and rehabilitation expenditure, and local government rates calculated on the basis of mine output.

The 50 per cent concession for FBT on concessional housing and travel for employees in remote areas was identified as a taxation arrangement which advantaged mining activities. Division 10 depreciation may in some cases also be concessional.

Taxation issues such as duty drawback, commercial tariff concessions, fuel excise and sales tax were not investigated as part of the inquiry.

The aggregate effect on the mining sector of the taxation arrangements analysed is not known. Clearly the list of taxes which disadvantage mining (relative to other activities) is longer than the list of taxes which advantage mining. But this is not sufficient to determine the balance.

Some of the taxation arrangements analysed - tariffs and fuel excises - are included in the estimates of effective rates of assistance presented in Volume 2, Appendix H. Others taxes are less amenable to quantification. These estimates of effective rates are the basis for simulations using the ORANI model to show the effect of removing assistance (see Volume 2, Appendix F).

The Commission's formal findings and recommendations in the tax area appears as part of the Overview.

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14 ROYALTIES

Royalties are not a tax but rather should be seen as a charge for the right to exploit minerals owned by the Crown. Ideally, the charge should reflect the value of the property right conferred (ie economic - or in this case mineral - rent). However, many parts of this report indicate ways in which available minerals rents are appropriated by others, rather than by governments on behalf of the people they represent. A variety of royalty regimes have been (or could be) used, some of which are based on mineral rent. Alternative royalty systems should be assessed on the basis of economic efficiency, administrative cost and their effects on the timing and pattern of royalty payments. Existing royalty arrangements dominated by output-based royalties are inefficient and should, in the Commission's view, be replaced by rent-based ones.

An important issue for this report is how we as a community can maximise our returns from Australia's mineral endowment. In general terms, this will be achieved by ensuring that we have an economically efficient mining industry - which is what most of this report is about - while at the same time taking an appropriate share of the net proceeds flowing from the exploration of what are, in most cases, publicly owned natural resources - which is the role of royalties.

However, these efficiency and distribution goals are interdependent since policies and practices aimed at achieving either one of these goals can jeopardise attainment of the other. For example, some types of royalties (and *de facto* royalties) adversely affect the efficient development of mining and mineral processing activities in this country (see Appendix E of Volume 2), while impediments to an efficient industry (such as overly generous remuneration packages, unproductive work practices and inefficient transport services) unnecessarily inflate costs and in the process appropriate part of the mineral rent, so reducing available surpluses to be collected on behalf of the community by royalties.

Most royalties are paid to State governments, although there are some private royalty payments. Special arrangements also apply to royalty payments in respect of minerals found on Aboriginal land (see Attachment 14A). Table 14.1 sets out royalty payments made to governments and others in 1987-88 for different minerals and the average share of turnover accounted for by royalty payments during the period 1977-78 to 1987-88.

14.1 Royalties are a charge not a tax

Royalties are, or should be seen as, 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 royalty payments). The distinction between a charge for the right to exploit a resource and a tax is clearly made by DPIE (1989 p.26):

Table 14.1: Mining turnover and mineral royalties by industry class, 1987-88
(\$million, per cent)

		Turnover	Royalties			
ASIC Code	Description		Gov't	Other	Total	Royalty ^a share of turnover
		\$m	\$m	\$m	\$m	%
METALLIC MINERALS -						
Ferrous Metal Ores -						
1111	Iron ores)					
1112	Iron ore pelletising)	2164	102.1	19.9	122.1	5.4
Non-ferrous metal ores -						
1121	Bauxite	601	26	34.5	60.4	5.7 ^b
1122	Copper ores	541	23.8	0	23.8	4.2
1123	Gold ores	2524	21.9 1	3.7	35.6	0.9
1124	Mineral sands	456	16	1.3	17.3	3.1
1125	Nickel ores	np	np	np	np	2.5 ^c
1126	Silver-lead-zinc ores	963	25.9	0	25.9	4.3
1127	Tin ores	69	np	np	np	2.1 ^d
1128	Uranium ores	np	np	np	np	
1129	Non-ferrous metal ores n.e.c	np	3.3	0.9	4.2	
11	Total metallic minerals	8080	227	93.9	321	4.0
COAL, OIL AND GAS -						
1201	Black coal	6498	185.8	3.9	189.7	3.4
1202	Brown coal	387	11.4	0	11.4	2.9 ^e
1300	Oil and gas	4273	364	49.8	413.8	10.8 ^e
12,13	Total coal, oil and gas	11157	561.2	53.6	614.9	
CONSTRUCTION MATERIALS						
1401	Sand and gravel	355	4.7	10.7	15.3	4.2
1404	Construction materials n.e.c.	684	3.7	9.8	13.5	1.9
14	Total construction materials	1039	8.4	20.5	28.8	2.6
OTHER NON-METALLIC MINERALS						
1501	Limestone	94	1.6	1.2	2.8	3.0
1502	Clays	41	0.4	0.3	0.7	1.6
1504	Salt	117	1.3	0	1.3	0.9
1505	Non-metallic minerals n.e.c.	384	20.7	2.8	23.4	6.0
15	Total other non-metallic minerals	636	23.9	4.3	28.2	2.9
TOTAL MINING (excl. services)		20912	820.5	172.3	992.9	3.6 ^f

a Generally 1977-78 to 1987-88.

b Excludes 1977-78.

c 1977-78 to 1982-83.

d Excludes 1987-88.

e 1982-83 to 1987-88.

f Excluding oil and gas (all years) and brown coal 1977-78 to 1981-82.

Source: ABS catalogue 8402.0.

The Government believes that where individuals or firms are provided with preferential rights to exploit a community resource, they should pay an appropriate charge to the community as owner of the resource.

Such charges by governments for the right to exploit community owned resources are often referred to as 'resource taxes', 'resource rent taxes' or 'secondary taxes'. These terms are misleading as these charges differ quite fundamentally from normal taxes such as income tax and company tax which are levies on economic activity.

The basis for imposing a charge for the use of a community resource rests with 'ownership'. If a fishery resource were owned by the private sector those allowed to use it would have to pay the private sector for that right. This payment would not be seen as a tax but rather as a price like the prices paid for goods and services used in everyday life. As the community owns the fisheries, it is reasonable for it to receive a price for the use of the fisheries resources in the same way as would a private sector owner. The alternative would be to have the benefits of use either accrue to a few individuals as windfall gains or be dissipated through wasteful investment in excess fishing capacity.

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 Section 3) to which an administration fee applies, with charges (in the form of 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.

It was also claimed that scarcity and quality rents which arise elsewhere in the economy (for example, those arising from regulation of entry such as applies to 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 Ltd (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, Western Mining Corporation argued (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.

What should governments do with royalty payments?

Since minerals represent non-renewable natural assets, exploiting them is akin to running down man-made 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 man-made assets so as to sustain the wealth created by the exploitation of Australia's natural resources.

The concept of mineral rent

A mining company undertakes a project on the expectation of making a profit on the investment involved. In order to justify the geological and economic uncertainty inherent in most such projects - sovereign risk is discussed later - 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 defined as opportunity costs (ie minimum expenditures necessary to attract the inputs such as labour and capital into the particular mining endeavour, rather than have those resources engaged in some other economic activity).

The mineral deposit is a necessary input into the process of earning project revenue - just like labour and capital. However, in the absence of a market for mineral rights there is no clearly defined price at which a mineral deposit could be purchased (analogous to wage rates for labour or interest rates on borrowings to finance investments in physical capital). The 'residual' calculation (revenues minus opportunity costs, or economic rent) is the value a particular mineral deposit would command if it were auctioned - in a certain world. In an uncertain world the auction would command bids based on expected mineral rent.

AMIC (sub. 29, p.78) illustrates the concept of economic rent as the value of mineral rights in the following:

The appropriate base for resource taxation can be illustrated by analogy to a private landholder, with full mineral rights, who wishes to assess and exploit any mineral resources which may be on his land, but who does not wish to engage personally in the actual exploration or mining operations.

First, the landowner would engage the services of an exploration company. This company must be remunerated at the market rate, a rate which is sufficient to cover operating costs plus a return to the capital employed. If a viable deposit were discovered, the landowner would then engage the services of a mining company to extract, process and market the minerals on his behalf, for a predetermined fee. The mining company would be paid at a rate sufficient to cover operating costs and to obtain a market rate of return to capital employed. The landowner would retain all revenues in excess of exploration and mining costs.

Note the crucial role of exploration costs in determining the surplus earned by the mineral deposit. The total costs of the landowner included the remuneration to the exploration company. Having discovered minerals it is viable for the landowner to contract the mining company if the mineral revenue is expected to exceed the company fee, even if the costs of exploration are not covered. At

this decision stage the costs of exploration are sunk - if he proceeds with mining there will be some surplus to offset (partly) the cost of exploration, which is better financially than not proceeding. However, in the longer run fewer and fewer resources will be attracted to mining investment if mineral revenues do not cover all costs, inclusive of exploration.

This example distinguishes between rent and quasi-rent. Expected mineral rent accounts for the cost of exploration (including the return on capital) and is the incentive for the landholder to pursue assessment and exploitation of his sub-surface property rights. The surplus earned for the extraction phase is quasi-rent and the expectation of quasi-rent was sufficient incentive for the landowner to mine the deposit. But if it eventuated that the quasi-rent was insufficient to cover the payment to the exploration company the landowner will suffer a reduction in wealth.

Thus, in practice the net value of (or mineral rent associated with) a deposit is much less than the net revenue from the extraction stage and includes the costs of attributable exploration activity. If royalties are levied as a percentage of quasi-rents (instead of actual rent) marginal projects will be deterred, while other projects will not earn the required rate of return. As EXXON stated (sub. 58, p.29) "any attempt to tax "rents" at rates higher than the industry can bear will drive down the level of industry activity and the base upon which rent or other taxation is imposed."

Changes in economic rent over time

If the objective of government is to obtain fair compensation for society for its ownership of minerals, does this mean that policies should be adopted to encourage exploitation when the mineral rent is highest (eg when mineral prices are high)? As (potential) mineral rent depends upon (expected) mineral prices (as well as costs), it has been argued that access to mineral rights should be restricted because the reserves will become more valuable as the scarcity of non-renewable minerals and prices increase.

However, there is evidence (see Attachment 8A) that the real price of many minerals has declined or remained constant for many years.

In the Commission's proposals to discourage current mineral production (either by restricting access or by charging excessive royalties) because of scarcity arguments are not justified.

The potential mineral rent of a deposit in situ changes, not only with the price of minerals, but also varies as the unit cost of extraction changes with technology, labour conditions, freight rates and all other cost components. However, even good business acumen cannot anticipate with certainty when mineral rent will be maximised - rarely is it known whether a tract of land will yield a profitable project, let alone when the surplus would be maximised. Thus, it is important to establish a system of access to mineral rights which contributes as far as possible to sensible business decisions about mineral exploitation at any given time. This is discussed in detail in Section 3. Royalty systems can then be solely directed at extracting a fair charge for whatever mining rights have been allocated.

Dissipation of mineral rent

As royalties presuppose the existence of economic rents associated with individual mineral deposits, it is important from society's point of view that any potential surplus is not dissipated or appropriated by others (eg mining companies, employees of mining companies or those providing necessary services to mining companies). Examples include unnecessary delays to projects once exploration expenditures have been incurred, insistence on unwarranted environmental compliance, unnecessary infrastructure requirements imposed by governments, overly generous labour conditions and remuneration for management and workers, and excessive charges on the part of public authorities (eg for rail services) (see the detailed sections elsewhere in the report).

In cases where mineral rent has been wholly dissipated (eg it has been appropriated via one or more of the above mentioned mechanisms), a royalty system that uses mineral rent as the 'tax' base will not generate any revenue, and only unconditional royalties - such as those based on physical production or sales value will do so. However, as explained in section 14.3 while these latter royalty methods ensure some return for the community, they also reduce the size of the mineral cake.

Additionally, when the threat exists that mineral returns will be largely dissipated or appropriated by others, governments at all levels (local, State and Federal) will be encouraged to impose *de facto* royalties such as excessive rail freights in order to ensure they get a piece of the action. These methods of collecting a return for ownership of minerals are effectively a tax on mining.

A chicken and egg problem can therefore result - rent is dissipated and appropriated in numerous ways but the likelihood that rents will be dissipated and appropriated one way or another encourages dissipating activity by labour, management and government alike.

The circle must be broken. Ways of preventing appropriation of mineral rents by others are discussed in the other sections of the report. More appropriate royalty systems are also part of breaking the circle.

If mineral rent was not dissipated (and an appropriate share returned to society) then there may be less need for foreign investment controls, imposed partly out of fears that rents will be repatriated overseas.

14.2 Alternative royalty systems

The basic royalty methods that may be used are described below. (Attachment 14B provides numerical examples of how to calculate royalty liability for a Brown tax and a Resource Rent Tax (RRT).)

Specific royalties are levied as a dollar amount per unit of output such as tonnes of ore, concentrate or contained metal.

Ad valorem royalties are levied as a percentage of the value of output (for example, ex-mine value or fob value).

`Accounting' profit royalties are levied on assessed profits, but this figure is not equal to mineral rent. The latter is best approximated by net cash flow; that is, capital expenditure would be fully deducted in the period it is incurred rather than apportioning capital charges (depreciation and interest on borrowed funds) over the life of the investment.

A pure-rent royalty (or Brown tax) is a symmetric tax/pay out on project net cash flows (ie mineral rent), in which the government takes a share of positive net cash flows or pays a rebate on losses at the tax rate, depending on the outcome. For example, in the exploration and development stages project costs will typically exceed revenues so if the Brown tax was (say) 50 per cent, the government would pay the developer half of the negative cash flow. When there is an excess of receipts over costs the company pays government half of the mineral rent.

The petroleum Resource Rent Tax (RRT) is an (imperfect) variant of a pure-rent royalty, in which the government takes a share of positive mineral rent but does not pay a rebate on losses. Instead, losses are compounded forward at a specified rate (threshold rate) and offset against future surpluses.

Cash bids at auction are also examples of pure-rent royalties because companies would bid on the basis of the expected mineral rent.

Combinations of the above basic royalty methods may also be used. For example, a combined Cash bid/pure rent royalty is the method advocated by the Commission (see Section 14.3). Also, combinations of *ad valorem* and profit-based royalties are used for some projects in Australia.

Current royalty methods and rates used in Australia

At present in Australia the most commonly used royalty methods are output based. Profit-based royalties are also used but are much less common. Cash bids, Brown taxes and Resource Rent taxes (RRT) are generally not used for charging for mineral rights. (Cash bids and RRT have been used for some petroleum leases in Australia and the up-front payments for NSW coal leases can be broadly interpreted as a cash bid).

A comparison of current royalty regimes used by State and Commonwealth governments for minerals and petroleum is provided in Table 14.2. It reveals that there is little uniformity of either the royalty method or the royalty rate both between jurisdictions and between minerals (even within the same State). The main features of the comparison are:

- The Northern Territory uses an 18 per cent accounting profit royalty for all mineral and petroleum projects that commenced after 1982 and for those which elected to change from the previous royalty arrangements;
- South Australia uses *ad valorem* royalties for all minerals and petroleum (except for a combination *ad valorem*/profit royalty for Roxby Downs);

Table 14.2: Comparison of royalty systems^a

<i>State</i>	<i>Metallic minerals</i>	<i>Coal</i>	<i>Oil and Gas</i>	<i>Other non-metallic minerals</i>	<i>Main exception</i>
NSW	4 per cent ad valorem or specific rates (\$0.35 per tonne bauxite, iron ore)	\$1.70 per tonne \$0.50 per tonne super royalty (7 open cut)	10 per cent ad valorem 11-12.5 per cent Secondary license	\$0.25 to \$0.85 per tonne	Broken Hill: 20 per cent (variable) profit Cobar: Progressive profit
Vic	2.75 per cent ad valorem		10 to 12.5 per cent ad valorem	\$0.70 to \$2.30 per tonne	Gold exempt.
Qld	Greater of 2 per cent ad valorem or 5 per cent Profit	5 per cent open cut 4 per cent underground \$0.05 per tonne (domestic use)	10 per cent ad valorem 11-12 per cent secondary license	\$0.25 to \$1.00 per tonne	Bauxite: greater of 10 per cent ad valorem or specific rate. Mt. Isa: specific rate (min \$1.00 per tonne).
SA	2.5 per cent ad valorem		10 per cent ad valorem	5 per cent ad valorem	Roxby downs: 2.5 per cent ad valorem plus profit component.
WA	Approx 10 per cent ad valorem (ore value)	\$1.00 per tonne \$0.50 per tonne (domestic use)		\$0.30 or \$0.50 per tonne	Argyle: greater of 7.5 per cent ad valorem or 22.5 per cent profit. Gallum: 25 per cent ad valorem. Gold exempt. Minerals sands: 5 per cent ad valorem (min. specific rate).
Tas	1 per cent ad valorem plus profit component		10 per cent ad valorem	\$0.50 to \$5.00 per unit (tonne or m ³)	Hellyer: 2.5 to 3.5 per cent ad valorem plus profit component.
NT	18 per cent profit over \$50 000 (post 1.7.82)		10 per cent ad valorem	1.25 per cent or 2.5 per cent (Aboriginal)	Alumina/ Bauxite: \$0.40 or \$0.50 long ton. Copper: 1.25 per cent ad valorem Tin: 1.25 per cent ad varlorem (or 2.5 per cent Aboriginal Land) Uranium: 1.5 per cent ad valorem (plus 4.25 per cent Commonwealth.)

^a not comprehensive – general features only (eg valuation point differs; deductions differ etc).

Source: State Mining and/or Royalty Acts (and supporting Regulations).

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- The other States have no dominant method. Queensland, NSW, WA and Victoria mostly follow a pattern of *ad valorem* royalties for metallic minerals and petroleum and specific royalties for non-metallic minerals and construction materials. The main differences to this structure are a 20 per cent profit royalty for the lead/silver/zinc project at Broken Hill (NSW) (based upon average ore grade and mining depth); a 22.5 per cent profit royalty (or minimum 7.5 per cent *ad valorem*) for the Argyle diamond project (WA); and a RRR (shared 25:75 with the Commonwealth) for Barrow Island (WA) petroleum;
 - Tasmania uses a combination *ad valorem*/profit royalty for metallic minerals (except the rates are different for the Hellyer project); specific royalties for non-metallic minerals and construction materials; and levies *ad valorem* royalties for petroleum; while
 - The Commonwealth government uses a 40 per cent RRT for Timor Sea petroleum and recently announced in the 1990-91 Budget that it will also apply to Bass Strait production. Other petroleum leases are subject to *ad valorem* royalties and excises. Uranium from Ranger is charged a 4.25 per cent *ad valorem* royalty.

14.3 The efficiency of alternative royalty systems

AMIC stated (sub. 29, p.75) "a system of royalty taxation designed to obtain a return to the community for resources which it owns should conform to the same principles of efficiency, equity and administration simplicity as general revenue taxation." The efficiency of alternate royalty methods is addressed in this sub-section (see also the detailed discussions in IAC (1988) and ABARE (1989), while equity and administration issues are covered in later sub-sections.

The economic efficiency of charging mechanisms is determined according to whether the charge influences decisions beyond the changes that would arise from the reduction in disposable income. An economic efficient charge is said to be 'neutral'. AMIC (sub. 29, p.69) said in the case of mining that "tax neutrality implies, among other things, that taxes do not affect the rate at which a company decides to extract a resource and the lowest marginal quality resource that a company decides to extract."

Tax neutrality may be weak or strong. ABARE (1989, p.11) makes the following distinction:

A tax is said to be weakly neutral if it does not alter the ranking of alternative risky projects for an agent. A tax is said to be strongly neutral if it satisfies weak neutrality and does not change the decisions of agents (that is, does not shift the cut-off point between those projects that would be undertaken and those that would not).

The relative efficiency of alternative royalty methods depends on what tax base the royalty is levied upon and the effect the royalty system has on the level of sovereign risk and uncertainty. As discussed above the value of a mineral right is the amount of mineral rent that is earned or is expected to be earned. A charge levied on some other valuation base - such as output - can be expected to distort mining investment decisions.

Output-based royalties

Royalties based on either the volume of production (specific royalties) or the gross value of production (*ad valorem* royalties) act as a disincentive to mining because they reduce the net price received per unit of output. Ore which was economically viable may be made submarginal and left unmined - a feature known as "highgrading" (see Box 14.1). Further, the unmined ore may not be exploited if the price-cost condition improves because the "highgrading" process may have "sterilised" pockets and pillars of economic ore.

Box 14.1: The effect of output based royalties on mining output

In the figure above, W is the world price at which the mineral can be sold and AS is the supply schedule. Consequently, it is viable to mine Q units of ore and the deposit would earn \$WAB economic rent. The imposition of an output royalty (\$AC per unit) would increase costs as represented by the schedule CR. It would then be viable to mine only until the Zth unit of ore. The deposit now generates less economic rent (\$WAED) of which the government receives \$CAED as royalty.

AMIC (sub. 29, p.81) emphasised that it is not only the reduction in profitability that discourages activity but the variability of returns:

Another serious disadvantage of output-based royalties is their tendency to exacerbate the variability of returns to mining. In periods of low prices, the fixed royalty may become a very large share of returns. In years of high prices, the specific output royalty will not increase unless the volume of output also increases. Since price variability appears to be the major source of variability in total returns to the mineral industry in Australia, this feature of specific royalties may cause a major increase in the variability of net returns in the mining industry.

In reference to the specific black coal royalty in NSW (see Box 14.2), Oakbridge explained (sub. 32, p.14) that, under output-based royalties, the inability of the mineral charge to vary with the net value of the deposit exacerbates sovereign risk and uncertainty:

... the level of royalty has changed frequently in recent years in line with the Governments' perceptions of what the industry can bear. As coal projects have a lifetime of decades it is very likely that the rate of royalty will change several times over project life. This adds considerably to developers' perceptions of sovereign risk and effectively increase the rate of return required from a new coal mining venture.

Box 14.2: The history of royalties at the Saxonvale open-cut mine

In the period that the mine has been in operation the specific rate royalty has been varied three times:

- . in February 1981 the royalty was increased from \$1.00 to \$1.70 per tonne;
- . in July 1987 the rate was decreased to \$1.36; and
- . in August 1989 it was increased again to \$1.70.

The coal lease conditions require that in addition to the prescribed royalty as set out and varied above, the mine also pays an additional "super" royalty, as follows: \$1.73 per tonne (for the first five years); \$1.82 per tonne (year six); \$1.91 (year seven); \$2.00 per tonne (year eight); and \$2.11 per tonne (year nine).

The super royalty was increased by 50 cents per tonne in May 1987, reduced 40 cents per tonne in July 1987 and increased again by 50 cents per tonne in August 1989

Source: Oakbridge (sub. 32, p.14)

Although governments keen to ensure continued mining have shown a propensity to allow downward negotiation of their output-based royalties if the alternative is mine closure, the administration and compliance costs of hardship reviews may be large. The process of reducing royalties in times of hardship also appears to be slower than the process of increasing them when the industry is doing well.

Profit-based royalties

A profit-based royalty is to be preferred to output-based ones since it represents a move in the direction of royalties based on the net value of a deposit. As AMIC (sub. 29, p.82) stated:

A profit-based royalty system automatically adjusts for changes in prices and costs and, as such overcomes many of the disadvantages associated with *ad valorem* and specific royalties. In particular profit-based royalties are not payable in times of losses, and therefore do not impede the ability of firms to survive cyclical downturns in market conditions.

However, accounting profit royalties are not neutral because the tax base will generally differ from the concept of economic rent. This is mainly due to the treatment of capital expenditure in calculating accounting profit, whereby annual depreciation is charged and interest paid on debt finance to purchase plant and equipment is deductible.

In an uncertain world characterised by inflation, this treatment of capital costs will differ from economic depreciation. In particular, the value of capital assets will be understated because of the effects of inflation and because no recognition of the opportunity cost of equity capital is made. (In contrast economic rent would be approximated by permitting the purchase price of physical capital to be fully deductible in the tax period it is incurred).

Second, to the extent that deductibility of exploration expenditure is restrictive in the company tax legislation (see Section 13.1), a profit-based royalty will tax returns to exploration investment. As emphasised above, mineral rent recognises the total costs of an exploration program and not the restrictive definition in the tax laws.

Third, even if the accounting profit tax base was identical to economic rent the profit royalty would be distorting because it would take a share of profits but only carry forward losses at historical cost. As explained below, for neutrality it would be necessary to allow losses to be compounded at an appropriate interest rate, otherwise the profit royalty would be an asymmetrical tax.

In general, if a profit-based royalty is levied at the same rate as a royalty based on economic rent it will result in a higher liability. As a form of compensation for this taxing effect, the 18 per cent Northern Territory profit based royalty deducts an annual lump sum of \$50 000 from profit before royalty is assessed.

Pure-rent royalties

AMIC (sub. 29 p.82) discussed the economic efficiency (in theory) of royalties levied on economic rent in the following terms:

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.

The neutrality of royalties levied on properly calculated mineral rent is shown in Figure 14.2 (see Box 14.3).

Box 14.3: The neutrality of rent based royalties

In the above figure W is the world price and AS is the supply schedule. Consequently, it is viable to mine Q units of ore and the deposit would earn $\$WAB$ economic rent. If royalty was levied as a percentage of rent (eg $\$CA/WA$) the mine will continue to produce Q units and pay royalty of $\$ACB$. The rent based royalty is neutral because the cut-off grade (Q) is unchanged by the imposition of the royalty. This contrasts with the output royalty in Box 14.1.

Competitive cash bids

The use of Competitive cash bids as a method for allocating mining leases is discussed in Section 3.

Under a Competitive cash bid system, companies would bid at auction up to the expected (risk-adjusted) net present value of the mineral rents they could earn from the area. Although the amount bid may subsequently prove to be larger or smaller than the actual value of rents, these 'losses' and 'gains' should not affect the level of industry activity since the industry will make a 'normal' return on capital, provided the distribution of gains and losses is relatively symmetrical over a reasonable sample size.

EXXON (sub. 58, p.32) however, argued that losses will be more likely than gains:

There will be a wide range of values placed on the exploration prospect. However, in each case, the winning bid will reflect the most optimistic evaluation of the prospect so that over time, the expected value of all prospects reflected in the winning bids will be overestimated. As a result, cash bids will be based on a greater expected value than is likely to eventuate ...

If this does occur in practice it is what the economic literature calls the winner's 'curse' and has been observed on occasions in the auction of oil leases in the United States. However, it would seem that the 'winners curse' is not due to the auction process itself, but rather to the fact that companies forecast over-optimistically from their exploration information. It would also seem to be a short-term phenomena until companies learn that they are being overly optimistic. Rather than abandon the use of auctions a suggested solution is for the winner to only pay the amount of the second highest bid.

Participants suggested that Competitive cash bids would not be efficient because the amount of the bid would reduce funds available for further exploration and development. However, the amount bid is a commitment of expected future profits which otherwise would have been collected by other royalty methods (if a cash bid system was not used). Therefore, the bid cannot (or should not be regarded as) a commitment of funds which otherwise would be efficiently devoted to exploration.

If cash bidding does affect the level of future exploration because of the effect on fixed exploration budgets, then this is a reflection of inefficiencies in the company budgetary process. As explained above, the cash bid alters the time profile of budgets but does not affect the expected amount of funds available for re-investment. In fact, if the uncertainty at the auction stage causes firms to severely discount the expected profitability of leases, then the amount of a winning bid may be substantially less than what the company would have paid under a conditional royalty system. The company would then have more funds available (over time) than it would have had otherwise!

It was also argued by some participants that cash bidding could force companies with superior information to bid away part of the return to this investment by speculative bidders at auction. Sealed bids could be used to cut off the 'bandwagon' effect at open auctions.

Some participants questioned the ability of the government as a single seller to foster a competitive market. The ACA (sub. 71, p.22) said:

The initial decision on what and where deposits were explored and developed, therefore, would invariably reside with the Government, thereby lessening the degree to which outcomes were genuinely market based.

Similarly, CRA indicated (sub. 73, p.39) that the government as a monopoly seller of mineral rights and possibly by the use of reserve prices would extract more mineral rent than would a competitive market (of many sellers). However, the Commission envisages the government being a passive seller whereby an auction is signalled by the industry itself when a company applies for an area. And reserve prices can be justified provided they are set no greater than the administrative costs of an auction.

While most arguments by participants against cash bids as an efficient royalty system are not well founded, one potentially legitimate argument relates to the sovereign risk aspects. The high degree of uncertainty about the prospectivity of deposits may result in bids which are very small in comparison to the subsequently realised value. Are governments prepared to be bound by the results of the auction? If companies believe there is a possibility of additional royalties once production commences then this risk will be incorporated into the bidding process by devaluing the expected mineral rent to be earned. This will change the cut-off point between viable and non-viable deposits - that is, not strongly neutral.

The problem of sovereign risk with low cash bids may be overcome for example, by conducting the auction subject to a pre-announced royalty (see below) so as to downplay the importance of the cash bid as a 'fair' return for society. Section 3 also discussed the importance of better property rights for limiting sovereign risk.

Brown tax

A pure-rent royalty (sometimes referred to as the Brown Tax) is a charge 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, the government would contribute half the cost of initial investments in the project and would receive half of the value of any future mineral rents generated by the project. 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 the risk that companies may not receive the government's full equity share of development costs, 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.

Rather than arbitrarily setting a threshold rate, neutrality could be better approximated by using the riskless rate of interest (long term bond rate) as the compounding factor and the government agreeing to pay a rebate at the RRT rate if there are unrecovered losses when a project terminates. This would establish a symmetrical tax on losses and gains.

However, if companies perceive a risk that the government will not pay termination losses (sovereign risk) then such an RRT arrangement would deter some investments. Rather than government paying rebates on termination losses, the losses could be traded by companies. (See ABARE 1989, pp. 42-43 for an outline of a market for losses). Since trading losses could be more or less efficient than government paying rebates on termination losses it may be best to give companies both options. By having two possible avenues available for loss compensation the RRT would be more symmetrical.

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.

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.

However, analysis by ABARE (1989) shows that the imposition of a Brown Tax may convert a submarginal project - one for which the net present value is negative - into one that is undertaken and therefore the pure rent tax is not neutral. This is because a risk-averse company values the percentage reduction in risk (or total costs) more than the same percentage reduction in revenues. The expected value is unchanged but the company is at a different position on its risk-return preference schedule. The Brown tax therefore, may not be "strongly" neutral but it does however, preserve the pre-royalty ranking of alternate projects and is therefore "weakly" neutral.

Interestingly, in the ABARE analysis the efficiency distortion of a Brown tax is expansionary - that is, mining companies should prefer Brown taxes to other royalty arrangements which discourage mining investment! (The Brown tax is unlikely to cause a contractionary distortion in the ABARE analysis because it would require a risk-preferring company). The Commission argues in Attachment 14C that the application of a Brown Tax to mining in Australia would not encourage an increase in mining investment in the manner described by ABARE.

A second potentially distorting effect of Brown taxes, also emphasised by ABARE, arises through a moral hazard mechanism. Since the Brown tax can be viewed as a type of insurance arrangement (where the firm pays the government a possible premium in economic rent forgone for partial insurance against possible losses) the act of insurance may increase the probability of the event being insured against.

To the extent that the Brown tax represents partial insurance of losses and may encourage more risky activity than otherwise, ABARE (1990b, p.32) suggest that the government could reduce the incentive by limiting its loss liability to a pre-specified amount or by not paying loss rebates for unsuccessful expenditure.

Finally, the importance of correctly defining mineral rent is re-emphasised as it is the foundation upon which the neutrality of pure rent royalties is built. In the case of the petroleum RRT it may appear that the limitations on deductibility may be compensated for by the threshold rate being set significantly above the long term bond rate. However, as Exxon (sub. 58, p.26) rightly state compensating for limited expenditure deductibility by increasing the threshold rate is necessarily an imperfect procedure.

Combined cash bid/pure rent royalty

The Centre of Policy Studies (1990, p.19) stated:

Concerns about risk aversion by both the private sector businesses and government and a preference for a more even temporal transfer of funds between the mining industry and government have led a number of analysts ... to propose the combination of an up-front bid and a preannounced realised resource rent tax royalty.

In Section 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 *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 *ex post* pure-rent royalty at zero (see Box 14.4). 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. 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 *ex post* to any mineral deposit which is subsequently found and exploited (an option referred to in Section 3). Emerson and Lloyd (1983) show that a combined cash bid/pure rent royalty system will be more efficient than sole reliance on either of the constituent parts if there is risk aversion by both the government and mining company. (It is theoretically possible for the combined royalty to be inferior to the use of only one of the instruments if both government and the company are not risk averse).

When mineral rights are auctioned subject to a pre-announced pure rent royalty 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). 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 whether bids at auction are deductible or not. Allowing or disallowing a deduction for the cash bid does not affect the net return to government (see Box 14.5) since bidders adjust their price to take account of the rules. However, deductibility does affect the 'comparability' of bids when non-mining interests are free to bid at auction. This is because, without deductibility, 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 intent on acquiring 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, with miners paying only what they actually bid.

Conclusions on the efficiency of alternate royalty methods

In theory, pure-rent royalties are more efficient than output-based royalties or profit-based royalties because they are based on the value of mineral rights - mineral rent - rather than some alternative tax base. The effect of inefficient royalty methods is to reduce the number and size of viable projects.

The inability of output-based royalty to vary with the net profitability may tempt governments to introduce additional taxation measures and necessitate costly hardship reviews and rate adjustments. For example, when a boom in world black coal prices created a windfall gain for existing operations, additional resource taxation such as excess rail freight charges and a coal export duty were introduced. This is less efficient or transparent than having explicit royalties which vary automatically with mineral surplus. Subsequently, when prices and costs have not been as favourable there has been lengthy lobbying and negotiation for lower imposts.

In practice, the extent to which inefficient royalty methods reduce the amount of potential mineral rent available to be shared between the investor and the government will depend upon royalty rates and the tax base upon which it is levied. Thus it is possible that an output royalty set at a 'low' rate may be less inefficient than a profit based royalty or an inappropriately designed RRT.

The Commission has simulated the effect on efficiency of alternate royalty schemes for a stylised project (see Appendix E of Volume 2). The message is that output royalties reduce the amount of mineral rent potentially available from the project compared to a pure-rent royalty.

ABARE (1990a) and (1990b) has also conducted simulation exercises on the efficiency of alternate royalty schemes. The first is a study of applying alternate royalty arrangements to crude oil projects. The second is a less comprehensive study of the effect on efficiency of black coal mining of various royalty arrangements.

Box 14.4: Auctioning mineral rights to Hill 260 - a numerical example of cash bidding and pure-rent royalties

Imagine an area whose mineral rights are to be allocated by auction either alone or subject to a pre-announced pure-rent royalty. (For the sake of expositional simplicity, bids are not assumed to be deductible in the case considered below, but see Box 14.5 for an example of the case where bids are deductible.) Those intent on exercising the mineral rights on offer (miners) could be expected to base their bids on the expected net present value of likely mineral rents, calculated by assigning probabilities to a range of anticipated outcomes. An example is illustrated below where a probability of 0.75 (or odds of 75 chances in 100) is assigned to an outcome expected to generate rents with a net present value of minus \$100 million (ie the project is very likely to generate negative rents, for example because an economic mineral deposit will not be discovered); 0.2 (or odds of 20 in 100) to an outcome yielding a net present value of \$150 million; and 0.05 (or odds of 5 in 100) that an outcome (bonanza) valued at \$1500 million will eventuate. Applying these probabilities to the respective amounts yields an expected net present value of \$30 million (equal to 0.75 times minus 100 plus 0.2 times 150 plus 0.05 times 1500) which would represent the maximum bid miners holding these *ex ante* expectations would be prepared to bid to secure the mineral rights outright (ie in the absence of any liability to pay royalties). If on the other hand a pure-rent royalty is to apply, miners will have to reduce their up-front bids (since in this example they are not deductible against future liabilities to pay royalties) by an appropriate amount whose size depends on the royalty rate specified by the government. Four royalty rates are considered below: 0 (which represents the situation where the rights are sold outright); and rates of 10, 50 and 90 per cent.

Expected outcome (\$m npv ^a)	-100	150	1 500	Expected
Associated probability	0.75	0.2	0.05	net
-----				return to
Royalty rate	Bid	Royalty payments to government		government
(%)	(\$m)	(\$m)	(\$m)	(\$m)
0	30	0 (30)	0 (30)	30
10	27	-10 (17)	15 (42)	30
50	15	-50 (-35)	75 (90)	30
90	3	-90 (-87)	135 (138)	30

a Net present value terms. Figures in brackets are the government's net financial position (equal to the bid plus royalty payments to government).

The example depicted above illustrates that even though the expected net return to the government (ie \$30 million - assuming that competition at the auction forces miners to bid the maximum they are prepared to pay) does not depend on the split between the *ex ante* component (ie the up-front bid) and the *ex post* component of the royalty regime. However, *ex post* outcomes can be very different - depending on what actually happens and the choice of royalty rate. For example, when the rate is 50 per cent miners would only be prepared to bid up to \$15 million at the auction because the government will take an expected \$15 million via the 50 per cent pure-rent royalty on realised rents. However, there can be only one outcome. If, for example, the project turned out to be something of a disaster and the outcome were in fact to be rents of *minus* \$100 million, then the government's share of this would involve having to *pay* the mining company \$50 million - leaving it in a *net* financial position of being \$35 million in the red (after taking into account the initial bid of \$15 million). At the other extreme, if the outcome is a 'bonanza', the government net financial position will be \$765 million in the black (comprising the \$15 million bid plus pure-rent royalties of \$750 million).

Box 14.5: What if conservation groups wish to bid for the mineral rights to Hill 260?

If non-mining interests (eg rural landowners and conservation groups) are free to bid at auction with the intention of not exercising the mineral rights to an area, then a problem of non-comparability of bids arises if pre-announced royalties are to apply in the event that mining takes place. This would mean that intending miners could not afford to bid the full value of mineral rights up front, with the possible result that the rights are not put to their best use from society's point of view. One way to achieve comparability is to allow bids to be deductible before assessing liability to pay royalties. This is illustrated below in the case of the 50 per cent pure-rent royalty example from Box 6.2.

Expected outcome (\$m npv ^a)		-100	150	1500		
Associated probability		0.75	0.2	0.05	Expected	
-----						net
Royalty rate	Bid	Bid deductible?	Royalty	payments to	government	return to government
(%)	(\$m)	(\$m)	(\$m)	(\$m)	(\$m)	(\$m)
50	15	No	-50 (-35)	75 (90)	750(765)	30
50	30	Yes	-65 (-35)	60 (90)	735(765)	30

a Net present value terms

In the case where the bid is deductible and rents with a net present value of *minus* \$100 million are realised, the miner deducts his/her \$30 million bid from the *minus* \$100 million realised rents - yielding a figure of minus \$130 million - for which the government must, in this particular case, pay \$65 million to the miner to discharge its obligation to go half share in the net proceeds of the project. Reading across the remainder of the row, if the outcome is \$150 million the government receives an additional \$60 million in royalties (taking its overall revenues to \$90 million), while if the outcome is \$1500 million the government receives \$735 million in royalties (taking overall receipts to \$765 million). Whether bids are deductible or not, the government's expected return continues to be \$30 million (as indeed its *ex post* net financial position remains unchanged - compare Box 14.4), but in the deductible case bids by prospective miners are now placed on a comparable basis to 'non-mining' bids.

Crude oil study

In ABARE (1990a) 8 748 hypothetical crude oil projects were generated by combining eight varying economic and geological characteristics - oil field size, exploration costs, development costs, operating costs, project life, production and cost profiles, the investor's real discount rate and the investor's real wealth. The net present value of mineral rent of each project was calculated which determined which projects were economically viable prior to royalty and which were not.

Alternate royalty systems - a Brown tax, RRT, company tax, specific royalty and a progressive volume royalty - were applied to the hypothetical projects. To permit consistent comparison of the effects of the different royalties on project viability and investor returns, the tax rates were set at rates which would give government an equivalent share of the pre-royalty net present value of a base case project. With this 'equivalence' framework the relative efficiency of each royalty was measured by the amount of pre-tax mineral rent that the royalty scheme discourages - that is, the mineral rent from abandoned projects.

The results of the simulation under the scenario of constant crude oil prices and risk neutrality are shown in Table 14.3. (The tax rates were set to take 40 per cent of the pre-royalty NPV of mineral rent). Not surprisingly, both the Brown tax and the modified RRT (ie where government pays rebates on termination losses) do not discourage any mining activity. Under the RRT without termination loss rebate there is a 6 per cent loss in economic rent. The profit royalty - levied as a company tax - ranks next best with a 9 per cent loss in economic rent; followed by the specific royalty with a 17 per cent loss; and the progressive volume royalty is worst with a 34 per cent loss.

Table 14.3: ABARE royalty simulations for crude oil ^a
(Per cent)

Royalty	Share of economic rent			Distortion ^b
	Loss	Investor	Government	
Brown tax	0	60	40	0
RRT (with loss rebate)	0	59	40	-1
RRT (without loss rebate)	6	48	46	-15
Company tax	9	45	46	-18
Specific royalty	17	40	43	-19
Progressive volume royalty	34	25	41	-38

a Assuming risk neutrality and constant crude oil prices.

b Distortion is the percentage deviation of investors after-royalty return compared to if the brown tax had applied.

Source: ABARE: (1990a), Table 3.

The results also show how the economic rents are shared between the investor and the government. (Consequently, these shares plus the loss described above equals the aggregate available pre-royalty rent - 100 percent). The investor share declines progressively from 60 per cent under the Brown tax to 25 per cent under the progressive volume royalty - because projects are progressively deterred. (This progressive reduction in investor returns is compared to returns under the Brown tax and shown in the column headed 'Distortion'). Concurrently, the government share is lowest at 40 per cent under the Brown tax and modified RRT and higher under the other royalty arrangements. (It is higher under the other schemes because the amount the government would have earned from deterred projects is less than the total rent forgone on these projects).

Results were also generated to show how the project characteristics affected the aggregate results. Naturally the neutrality of the Brown tax was unaffected by variations in the different project characteristics. For the modified RRT some uneconomic projects became viable when the threshold rate was set higher than the company's discount rate - that is, overcompensation for risk. (Recall that a RRT with loss offsets is neutral if the threshold rate is the long term bond rate). The production based royalties were very sensitive to certain characteristics in particular, field size and project life. Overall, the efficiency rankings in Table 14.3 - the loss in economic rent - remained unchanged for most project characteristics.

The black coal study

In ABARE (1990b) a similar methodology to the crude oil study was used to study the effects of royalty systems on black coal mining. Variations in several project characteristics generated 162 prospective mines - divided equally between open-cut and underground deposits.

The royalty systems simulated were a Brown tax, a RRT, an *ad valorem* royalty and a specific royalty. The royalty rates were calibrated to achieve a 40 per cent tax take by the government of the rent from a base case project - 40 per cent for the Brown tax and RRT, 11.45 per cent for the *ad valorem* royalty and \$5.38 per tonne for the specific royalty (which was interpreted as including the excess rail freight charges specified as part of the economic environment faced by projects).

Results of the simulations are provided in Table 14.4 and are divided into three scenarios depending upon the trend in real coal prices - constant, 1 per cent rise per year and 1 per cent fall per year. For the constant price scenario the Brown tax and the RRT are neutral but the *ad valorem* and specific royalty each result in a loss of potential mineral rent of 15 per cent. That is, pre-royalty there are 144 viable projects of the 162 proposed but the imposition of an output royalty deters 21 projects.

For the rising price scenario there are initially 160 viable projects. The imposition of royalties deters no mines in the case of a Brown tax, 2 mines if there is a RRT and 15 mines for both the *ad valorem* and specific royalty. The third row of results for each scenario - the percentage deviation of after-tax investor returns on projects which proceed relative to returns on these projects if a neutral tax had applied - shows that the RRT overtaxes by 2 per cent and that the *ad valorem* and specific royalties undertax by 6 per cent and 12 per cent respectively.

For the falling price scenario there are 125 projects viable before royalty but only 122, 95 and 92 respectively, are viable when the RRT, *ad valorem* or specific royalty is levied. The distortion results show the RRT slightly undertaxing investors relative to a neutral tax (2 per cent), no difference to investors' returns (for projects which proceed) if there is an *ad valorem* royalty, and overtaking (4 per cent) if there is a specific royalty.

The ABARE results showed that underground mines were adversely affected slightly more by output royalties than were open-cut mines. It was also found that operating cost profiles had an important impact on the results for output royalties and that differences between the threshold rate and the company discount rate were important for the RRT results.

Table 14.4: ABARE royalty simulations for black coal ^a
(Per cent and numbers)

	<i>Brown Tax</i>	<i>RRT</i>	<i>Ad valorem</i>	<i>Specific</i>
Scenario 1:				
<u>Constant real prices - 144 viable projects</u>				
Loss of pre-royalty economic rent (%)	0	0	15	15
Projects deterred (No.)	0	0	21	22
Change in investors return (%) ^b	0	0	0	1
Scenario 2:				
<u>Rising real prices - 160 viable projects</u>				
Loss of pre-royalty economic rent (%)	0	1	9	9
Projects deterred (No.)	0	2	15	15
Change in investors return (%) ^b	0	-2	6	12
Scenario 3:				
<u>Falling real prices - 125 viable projects</u>				
Loss of pre-royalty economic rent (%)	0	2	24	26
Projects deterred (No.)	0	3	30	33
Change in investors return (%) ^b	0	2	0	-4

a Results for aggregate open-cut and underground mines.

b Deviation in the after tax return of investors compared to after tax return under the Brown tax.

Source: ABARE (1990b), Tables 16, 17 and 18.

The ABARE results clearly indicate the potential loss in activity of using inefficient royalty systems. And it would be inappropriate to attempt to minimise the efficiency loss of output royalties by setting 'low' rates because the community would then be forgoing a 'fair' return for mineral rights. This would create the incentive for a multitude of other implicit resource taxes to be imposed which are themselves inefficient.

While the relative efficiency effects of alternate royalty systems can be quantified (on the basis of the different tax bases used) the sovereign risk or effect on risk aversion cannot be measured. Clearly, sovereign risk is ever present regardless of which royalty system is used because the government always has the potential to change the rules. The Centre of Policy Studies (1990, p.20) suggests that this situation could be improved:

Perhaps the only solution to the sovereign risk difficulty, which affects all tax regimes, is some form of broad contract where governments agree to ceiling levels of total taxes and charges. Recent experience might suggest that such indenture agreements are hard to achieve - and may further delay what is already a protracted process. Nevertheless, it remains crucial to any taxing strategy that the company can have reasonable certainty that government will act in a predictable and not opportunistic fashion.

However, the royalty system itself may also contribute to differing levels of sovereign risk - output royalties suffer because they do not relate returns to the net value earned; rent based royalties suffer because most of the rent is currently dissipated or appropriated by interest groups before royalty is levied; and cash bids suffer because bids may be much lower than what conditional royalties could accrue for governments.

The relative strength of the sovereign risk in each of these situations cannot be measured. But for policy purposes the potential for sovereign risk can be mitigated to some extent: a move to a royalty system where liability varies with the net value of the deposit - rent based rather than output based - would improve things; and many of the recommendations in this report will help to alleviate the problems of rent dissipation and appropriation which may undermine a rent based system. Further, where cash bids are used to allocate mineral rights they could be conducted subject to a pre-announced rent based royalty system to apply to subsequent production.

14.4 Other criteria for judging royalty schemes

The above sections analysed alternate royalty schemes in terms of their effect on mining investment decisions. There are other aspects of the efficiency of royalty systems such as administration and compliance costs and the timing and pattern of royalty payments. These issues are discussed below

Administration and compliance costs

Paperwork requires real resources. Both the government and companies incur costs which must be offset against royalty revenue and company profits. The QCA (sub. 70, p.13) said "as far as practicable, a royalty system should be simple and inexpensive for the Government to administer and companies to comply with". Therefore, what are the relative 'paper' costs of alternate royalty systems?

Specific royalties are the easiest to administer because only production statistics need verification. *Ad valorem* royalty calculations are more complicated as they involve valuation of minerals and require some auditing procedures if transport costs are deducted from sales revenue to levy the royalty on an ex-mine basis. Profit based and rent based methods require more extensive auditing procedures since many types of expenses are able to be claimed against revenue.

A crude measure of the cost effectiveness of royalty systems would be the ratio of collection expenses to royalty payments however, much care would be needed to interpret this ratio for example, for rent based schemes the ratio will dramatically increase during the life of a mine as it progresses from the first few years of negative cash flow to sometimes, several years of enormous mineral surplus. Also the auditing procedures for profit and rent based schemes intermittently result in assessments for additional payments (and refunds) which render any point-in-time ratios inaccurate.

For output based royalties point-in-time estimates of cost effectiveness can also be misleading because they may not include the costs of infrequent reviews of hardship cases. Volume and gross value royalties often involve time consuming reviews of hardship cases since this type of royalty is insensitive to changing economic conditions. For example, royalty rates for black coal in NSW were reduced, frozen and then re-established to original levels between 1987 and 1989 as a result of the fluctuating fortunes of the industry. The review process and company lobbying costs should be matched against revenue collected in any evaluation of cost effectiveness of royalty systems.

A royalty system based on information required for other purposes such as company taxation or mining census will reduce the compliance costs for companies. As previously mentioned above, rent based royalties which rely upon cash flow concepts should require no additional generation of primary information - just assembly in a slightly different form to other statutory requirements.

Lobbying costs could be expected to be lower for a system where royalty payments respond to the value of mineral rights for example, rent based methods compared to specific and *ad valorem* royalties. Of course a royalty system based on net value would encourage companies to expend more effort on avoidance.

As a benchmark for comparing administration costs the NSW Department of Mines and Energy keeps 12.5 per cent of black coal royalties collected on behalf of private owners as an administration charge! But is this under or over cost - recovery? Further evidence on cost effectiveness of royalty systems was provided by the WA Department of Resources Development (sub. 28, B13) which claimed that one royalty officer is able to collect royalty from more than 20 mining projects subject to specific and *ad valorem* rates but that the audit procedures for the Argyle profit based scheme requires 0.5 man years and yields less revenue.

Although there may be differences in administration costs of alternate royalty systems, the issue is whether they are sufficient to offset the differences in efficiency described in section 14.3. For example, The Northern Territory Department of Mines and Energy (1981, p.1) assessed that the extra revenue that would be raised by the proposed 35 per cent profit royalty would exceed the additional administration costs by more than 100 to 1. (The Territory subsequently introduced the profit royalty at a rate of 18 per cent).

In the case of the Argyle profit scheme mentioned above, the fact that the government settled for the profit related scheme rather than an *ad valorem* royalty reflects the opinion that the benefits of the profit scheme exceed the higher collection costs compared to traditional output royalties. The government said (sub. 48, p. B7) "the adoption of the profit-based component for Argyle diamonds is a result of the expected windfall profits for this project at the time of negotiations in 1981". If the project achieves the expected prosperity then the cost effectiveness of the profit royalty will be substantially increased.

The balancing of higher administration costs against gains in efficiency will not always be in favour of rent based royalty systems. The WA government (sub. 48, B6) explained:

The Specific Rate Royalties were established for low value commodities where the administrative cost of auditing sales records did not justify the royalty collected.

'Low' value commodities are generally regarded as non-metallic minerals except coal (such as limestone, clays and salt) and construction materials (such as sand and gravel). Since these minerals account for about 10 per cent of the total value of minerals (under reference) the potential inefficiency of using output based royalties for these commodities is less important than for metallic minerals.

Superficially, cash bidding involves the least administration costs because of the one-off collection process. However, there would be considerable preparatory effort by government and industry. This suggests the need to consider the efficiency of the entire system of allocation and charging for mineral rights including the administration and compliance costs.

In this regard the Australian Conservation Foundation (sub. 68 p.21) stated for Tasmania:

In only five 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.

Effects on government budgets of the level and pattern of royalty payments

In the introductory comments to this Section it was explained that royalty revenue should be treated as capital rather than current budget items. Presently, governments treat royalty revenue as current income and therefore the design of royalty systems are heavily influenced by their budgetary effects. WMC (sub. 69, p.33) commented:

Of particular importance to governments is the stable and predictable flow of revenue which these [*ad valorem*] forms of mineral taxation offer. Overall, governments tend to be engaged in the provision of programs requiring constant and steady sources of revenue. Exchanging a stable revenue flow for one which fluctuated with the mineral cycle or worse, one which required the government to rebate revenue, would make government planning very difficult - especially in the States, for which mineral taxes often represent a significant proportion of revenues.

In contrast, the Queensland Coal Association (sub. 70, p.13) said "stability of Government revenue is not an appropriate royalty criterion."

Under the Commission's suggestion of creating a Mineral Accumulation Account government's would derive current revenue as the earnings from the capital rather than consume the capital each year.

For a single project, specific and *ad valorem* royalties could be expected to provide a more stable flow of royalty revenue for government compared to net value based royalties because the determinants of the royalty base fluctuate less. But government revenue stability from specific and *ad valorem* schemes can only be bought at the expense of instability in mining company net returns. Which is the lesser of the two evils?

It is not clear that revenue flows from rent based royalties would adversely affect the budgetary process of governments. While at the project level the pattern of royalty payments would be significantly different, at the aggregate level there would be much less variability. This is analogous to mining companies diversifying across a number of mines and different minerals to withstand the fluctuations of mineral prices.

The impact of more variable royalty payments on state budgets depends upon both the share in state revenues and the variability of the collections. Table 14.5 shows the relationship between royalty revenues and state budgets between 1977-78 and 1987-88. Western Australia is the state for which royalty payments represented the largest share, on average, of state revenue during the period (excluding commonwealth grants and public authority dividends) - almost 9 per cent. Tasmania recorded the lowest average share - less than 1 per cent. (The Queensland share would be higher if excess rail freight charges were included on the basis that they are *de facto* royalties).

The table also shows that for some states (Victoria, South Australia, Western Australia, and Tasmania) the variability of royalty payments during the period was greater than the variability of respective state revenue. This may indicate that existing royalty systems do not generate revenue flows as stable as might be thought.

Except for WA (and Queensland if excess rail charges were removed and a rent based royalty system filled the void), the impact of any increased variability of royalty revenue would be sufficiently muted by the low share of royalty revenue in state budgets and the fact that state governments have experienced (and coped) with variability in royalty revenue under current arrangements. Ultimately, compared to the importance of commonwealth grants for state revenue the variability of mining royalties may be inconsequential.

Table 14.5 : Royalty revenue and State budgets, 1977-78 to 1987-88

<i>State</i>	<i>Royalty share of state revenue (Per cent)</i>	<i>Variability of royalty revenue^c</i>	<i>Variability of State revenue^c</i>
NSW	2.00	4.52	9.40
VIC	3.51	10.20	6.45
QLD	5.39	1.74	42.15
SA	1.83	45.23	40.85
WA	8.76	43.36	42.92
TAS	0.63	40.46	40.22
NT ^b	4.85	40.43	40.84

a Royalty revenue includes oil and gas. State revenue defined as exclusive of commonwealth grants and public authority dividends.

b 1978-79 - 1987-88

c Variability calculated as the variance of the differences between actual values and predicted values (and standardised by dividing by mean). Predicted values were generated by fitting exponential function to actual values.

Sources: ABS catalogue 5501

ABS Year book (various years).

Further, what really matters in the budgetary process is differences in expected and actual outcomes. At the aggregate level there may be little difference in the predictability of royalty revenue under alternate royalty systems.

While the government views royalty from an aggregate perspective the companies have a project focus. Companies should have a preference for a royalty system where the liability varies with the capacity to pay (such as rent based systems) compared to an alternate system where the same aggregate liability is paid in a different pattern (such as output systems). However, in practice the choice for a company may be between a system with a lower aggregate stream of payments but a less favourable timing of payments and a royalty system with higher aggregate payment but more favourable pattern of liability.

Finally, the pattern of royalty payments is also of a concern to Aborigines. The royalty equivalents paid to the Aboriginal Benefit Trust Account (ABTA) by the Commonwealth come from a small number of projects (see Attachment 14A). The effect of alternate royalty systems on revenue flow at the project level would seem crucial to financial planning by the recipients of ABTA funds.

However, if Aboriginal financial planning is adversely affected by the timing and level of royalty payments under a more efficient rent based royalty system, it may be better to instigate alternate compensation arrangements for Aborigines for mining on their land than to maintain a less efficient royalty system with existing financial arrangements.

14.5 Some practical considerations

While the above discussion assesses the relative merits of alternate royalty systems on a number of grounds there are some decisions that must be made regardless of what system applies in practice. These are what royalty rate to choose and whether any change in royalty systems should apply only to 'greenfield' projects or also to existing projects.

These issues are discussed below.

What royalty rate?

The choice of royalty rates by State governments reflects a philosophy of how much the community is entitled to receive for its minerals. Historically, this has normally been expressed in terms of a share of the value of ore as taken from the ground - an *ad valorem* approach. For example, Bradley (1986) explains that in the 1981 review of the Western Australian royalty system "the schedule of *ad valorem* rates was rationalised as being consistent with a ten per cent share of minehead value."

However, as previously explained setting an *ad valorem* royalty rate may result in very large or very small shares of mineral rent - the true value to the community. This has led to the imposition of *de facto* royalties such as excess infrastructure charges to share in (perceived) large rents, and increased administration costs for hardship reviews when mineral rent is negative. In recognition of these problems State governments have more recently incorporated profit-based schemes into the royalty schedule to better relate the return to the community to the net value of the deposit.

With different royalty rates and royalty bases applying throughout Australia it is obvious that different shares of mineral rent are collected by each state and for each mineral. However, for comparative analysis the most common approach is to express royalty payments as a percentage of value (an *ad valorem* equivalent) rather than the monumental task of calculating shares of mineral rent.

The former measure is used by the Commonwealth Grants Commission in assessing States' relative revenue raising capacity. This is dangerous because it presupposes that a high ratio is admirable such that states with low values can increase royalty rates to raise more revenue. What benefit to the community is there from a higher *ad valorem* ratio if the adverse effects on efficiency results in fewer viable projects?

Notwithstanding the limited analytical value of such ratios, Tables 14.1 and 14.6 show this information. Table 14.1 indicates that during the period 1977-78 to 1987-88 royalties have represented an average of 3.6 per cent of mineral turnover. The ratios for individual minerals vary considerably, from a maximum 6 per cent for non-metallic minerals n.e.c. to under 1 per cent for gold and salt. Royalties represent a much smaller share of turnover value for the major minerals black coal (3.4 per cent) and iron ore (5.4 per cent) compared to oil and gas production (10.8 per cent).

At the state level, Table 14.6 shows the six year (1982-83 to 1987-88) average of royalties as a percentage of state mineral turnover. The shares range from a high of 6.1 per cent for Victoria to a low of 0.9 per cent for Northern Territory. Further information is required to disentangle the effects of oil and gas, gold and coal on these State and Territory results.

Table 14.6: Royalties as a share of State mineral turnover, 1982-83 to 1987-88
(Per cent)

<i>State</i>	<i>6 Year average of royalties as a share of turnover^a</i>
NSW	3.1
VIC	6.2
QLD	3.6
SA	3.4
WA	3.4 ^b
TAS	4.7
NT	0.9

a includes oil, gas production and royalties

b excludes sand and gravel turnover

Sources: ABS catalogue 8402.0, 1990

While these ratios appear 'low' (for example, compared to the 10 per cent philosophy referred to above) it would be inappropriate to increase existing output royalties because of the adverse effects on efficiency. It could be expected that state governments, with their experience with output royalties and the numerous changes to rates over time, have iterated towards the rates which best balance the adverse efficiency effects of higher rates with the degree of 'under-collection' from highly profitable leases. On this basis it would be difficult to propose any changes to existing output royalty rates except for tinkering as price and cost conditions show new trends.

The choice of royalty rate is not so restrictive for rent-based royalties. Since the royalty is levied on 'surplus' profit a wide range of royalty rates are consistent with economic efficiency. In theory, the owner is entitled to 100 per cent of mineral rent but in practice very high rates may create problems of moral hazard (see 14.3). This still leaves a very large range of feasible rates, the choice being determined by the governments degree of risk aversion since it becomes a silent equity partner (see 14.3).

Bradley (1986, p.99) explains that if a fundamental change to rent royalties is contemplated, the existing systems dominated by output royalties will provide a signal or expectation about the royalty rate from the new system:

... past experience is not very helpful in dealing with the problem of establishing rate levels for a new royalty system, because it cannot be translated to the appropriate share of net resource value. However, history cannot be ignored. Expectations have been formed, both by the State and by the industry, in regard to the size of future royalty payments.

This suggests that if a rent based royalty was adopted the rate should be set so as that an equivalent royalty is paid as under current *ad valorem* and specific rates. But since this would involve different rent royalties for all existing mines, and as the 'equivalence' is only valid at a point in time it does not seem a strong basis for policy. Second, what 'average' rate would apply to new mines? Third, since a rent based royalty would be linked to the capacity to pay it matters less that the royalty liability would be different to the liability under existing arrangements.

These considerations suggest that a policy of 'equivalence' with existing royalty payments is impractical but is however, probably a useful starting benchmark. Some indications of 'equivalence' are provided by the following examples.

Using a survey of mining profitability the Northern Territory Department of Mines and Energy (1981) calculated that a 35 per cent profit royalty was a reasonable approximation to an *ad valorem* royalty of 10 to 12 per cent on a fob basis. The 18 per cent profit royalty subsequently legislated would therefore be expected to be equal to approximately 5 to 6 per cent fob.

In the reverse direction, ERA (sub. 57, table 4) calculate for the Ranger uranium mine that *ad valorem* royalties paid to the Northern Territory and Commonwealth governments and lease payments made to the NLC between 1982 and 1989 were equivalent to 26.2 per cent of after tax profit. The annual shares ranged from 21.2 per cent to 30.5 per cent.

At the aggregate level AMIC (sub. 29, Table 6) presented data for mineral industry taxation and profits for the period 1984 to 1989. This showed that royalties, tenement and licence fees represented 14.3 per cent of pre-tax profits. The share in each year ranged from a low of 9.5 per cent in 1989 to a high of 20.3 per cent in 1984. Besides being a guide to what rate for an accounting profit based royalty would have been approximately equivalent to the amount of royalty collected in those years (under other types of royalties), it also highlights the regressive nature of the output royalties.

For the net value type royalties used in practice the rates are: a base case 20 per cent for Broken Hill (depending on mine depth and ore concentration); 22.5 per cent for Argyle Diamonds; and 40 per cent for the Commonwealth RRT for petroleum.

One final aspect of setting royalty rates is whether they should distinguish between export and domestic use and between private and public mines? In Queensland lower royalty applies to domestically used coal than export coal. If the coal is of the same quality then different rates will adversely affect efficient investment decisions and cannot be justified, as it is sometimes, on the grounds that lower domestic rates encourages further processing within the state. Alternatively, if a rent based royalty applied at the same rate for domestic and export coal the amount of royalty would vary automatically with the value (quality) of the coal.

Should publicly owned mines pay royalties for example, coal mines used to supply public electricity authorities? An exemption is not justified on the basis that the payment of royalties would be offset by lower public electricity authority profitability and leave the government budget unchanged because there is not always a direct link between consolidated revenue and public utility profitability. More serious would be the adverse effect on resource efficiency of undervaluing an input into electricity production (for example see the discussion in section 18 regarding the valuing of coal inputs used for electricity generation for the aluminium industry).

Greenfields versus Brownfields

If there was a fundamental change in royalty systems (on the grounds of greater efficiency) then should existing projects also convert to the new arrangements? A change could be optional or compulsory.

If the current royalty arrangements dominated by output based royalties continued to apply to existing projects and rent based royalties applied to greenfields then there would likely be some glaring inequities. For example, consider new coal projects which in the first few years pay no royalty (or receive government payments under a Brown tax) while simultaneously, existing coal developments continue to pay royalties, possibly when the project is in recession. Such a case of inequity can be overcome by allowing existing projects the option of changing to the new system. In that way any inequity for existing projects would be through choice - not government imposed!

But would all existing projects change to a new rent based system? Clearly, it depends upon a comparison of both the net present value of aggregate royalty liability under alternate schemes and the effect on the pattern of payments. For royalty systems with the same aggregate liability, the one for which the structure of payments is more closely related to the capacity to pay should be preferred - a rent based approach. The reluctance of an existing project to change suggests that under the current arrangements it is very profitable and the community is undercharging for the mining right (or charging in less efficient indirect ways such as excess rail charges).

If compulsory changeover was enforced it would be necessary to permit a 'grace' period before the new scheme would apply such as was done with the pre-announcement of the intention to tax gold income. Phasing arrangements for tariffs rather than immediately implementing the intended long term rates is a similar adjustment arrangement.

Of course a change midstream for brownfields, if it is not optional, raises the issue of sovereign risk and uncertainty. In recognition of these problems, the Commission considers that a fundamental change in the royalty systems of existing projects should not be a unilateral decision of government. If companies were given the option to change to a new royalty system it should be a once-only choice.

14.6 Conclusions

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 its 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.

As noted in Section 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. 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.

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14A ROYALTY ARRANGEMENTS FOR MINING ON ABORIGINAL LAND

14A.1 Northern Territory

In the Northern Territory royalties and other negotiated payments are made to Aborigines for mining activities conducted on Aboriginal land.

Under section 63 of the *Aboriginal Land Rights Act (NT)*, mineral royalty equivalents are payable from the Commonwealth's Consolidated Revenue Fund into the Aboriginal Benefits Trust Account (ABTA). These royalty equivalents are based on – but additional to – the royalties paid by mining companies to the Northern Territory Government (and to the Commonwealth Government in respect of uranium).

Consequently, any changes to royalty policy which affect the level and pattern of royalty payments will directly affect the 'equivalent' amounts paid by the Commonwealth into ABTA.

Under the provisions of section 64 of the Act, 40 per cent of ABTA revenue is to be paid to the Northern, Central and Tiwi Land Councils in the ratio 23:15:2 for their administration costs; and a further 30 per cent is paid to the Northern Land Council for distribution to traditional owners whose interests are represented by the Gagudju Association (Ranger), and the Kuwinjku Association (Narbalek). The balance of moneys in the ABTA is retained for administration expenses and used for the benefit of all Aborigines in the Northern Territory (such as through investments and grants). Since 1978-79, when royalty equivalents were first paid to the ABTA, approximately \$145 million has been paid into the account. The distribution has been 50 per cent for administration costs, 30 per cent for traditional owners and 20 per cent for general applications.

The Environmental Centre (NT) (sub.126) expressed concern that environmental considerations may be compromised because the level of Land Council funding was directly related to the amount of royalties: "As the Land Councils are currently the only body providing impartial advice to traditional owners concerning mining issues, there is considerable conflict of interest with respect to the funding of the Land Councils through mining royalties."

The Commission recommended in section 4 that the monopoly over negotiating agreements with mining companies cease and that the 40 per cent share of subsequent royalties currently paid to Land Councils for administration costs be paid directly to the traditional owners, with Land Councils funded from the Commonwealth Budget.

In addition to royalty equivalents, Aborigines may also receive payments direct from mining companies negotiated as part of the condition of access. This situation is possible because surface land rights and the right of veto gives the Aborigines considerable bargaining power in terms of access to minerals.

The negotiation of payments additional to statutory royalties was identified as an impediment to mining either because of the inherent delay in the process or because the payments were considered unjustified.

The Northern Territory Government (sub. 136, p.6) stated:

Under the provisions of the *ALP (NT) Act*, it clearly states that when reaching agreement upon the terms and conditions for a exploration licence, payment shall be compensation for damage and disturbance to the land. It specifically states that it shall **not** include compensation for the value of minerals.

A major stumbling block to reaching exploration agreements has been the land council's insistence on negotiating private royalties at the exploration stage prior to the company even setting foot on the land. Even though the ownership of the minerals rests solely with the Northern Territory, agreements at the mining stage may take the value of the minerals into account.

The introduction of the open ended nature of the terms and conditions which no set parameters, was strongly opposed by the mining industry. This had no effect on the Federal Government. They have moved from a position in 1985 of no veto and the value of minerals was not taken into account to introducing amendments in 1987 in which the veto became a commercial tool with the land councils negotiating a share of the value of the minerals at the exploration stage.

The Northern Territory Government (sub. 136, p.14) also queried whether the Federal Government, through the adverse impact of the *ALR (NT) Act* on mining development in the territory, was strategically reducing its payments to ABTA and noted that the ABTA is projected to run out of uncommitted funds before 1994.

The Northern Land Council indicated that agreement on the additional payments can be constrained by not knowing the statutory royalty arrangements (because of discretion in the system). However, in the Northern Territory this should not arise under the current arrangements – except for uranium – where it would be known that any new development would be subject to the standard 18 per cent profit royalty.

Currently, there are seven mining and petroleum operations on Aboriginal land in the Northern Territory. The amounts paid to ABTA in respect of these and the additional arrangements negotiated by the Land Councils on behalf of the traditional owners are detailed in Table 14A.1. Also included in the table are the details of the agreement signed in 1982 with Pancontinental to mine the Jabiluka uranium deposit, yet to commence production.

14A.2 Queensland

The financial arrangements for mining on Aboriginal land differs in Queensland compared to the Northern Territory. The Queensland Aboriginal and Torres Strait Islander Commission (sub.91, p.11) said:

Currently neither Aboriginal and Islander Councils nor traditional owners receive any royalties whatsoever for mining on their land. A form of compensation is believed to have been collected by the Queensland Department of Aboriginal and Islander Affairs on behalf of the Aboriginal Welfare Fund. None of this money goes directly to the owners.

Aboriginal and Islander people appear to be significantly disadvantaged under the Minerals Resource Act in term of compensation, particularly as any form of royalty has been expressly denied all land owners.

14A.3 Conclusions

The nature of land rights determines the extent to which indigenous people derive payment for mining operations on their land. In the Northern Territory, Aborigines receive amounts equivalent to the statutory royalties as well as additional amounts negotiated as a condition of access. In contrast, there is no direct benefits for Aborigines and Islander people in Queensland for mining operations on their land.

The amounts received by Aborigines in the Northern Territory are affected by the level and pattern of statutory royalties. Concern has been raised about the outlook for reduced ABTA funds (because of falling uranium prices and the lack of new developments in the Territory). This may result in Aborigines being unable to meet prior commitments of expected ABTA funds.

Table 14a.1: Royalties paid to Aborigines in the Northern Territory
(\$million)

<i>Mining Company</i>	<i>Amount 'paid' to the ABTA between 1988-89 and 1988/89</i>	<i>Years Agreement was signed</i>	<i>Additional royalty paid to the traditional owners</i>
Nabalco (bauxite) - Gove Peninsula	22.9	1968	10 per cent of statutory royalties
Gemo (manganese) - Groote Eylandt	16.4	1965	\$5 000 per annum plus 1 1/4 per cent ad valorem
Queensland Mines (Uranium) - Nabarlek	14.4	1979	\$735 000 initially plus \$500 000 per year
Energy Resources of Australia (uranium) - Ranger	79.1	1978	\$1.3 million initially plus (currently) \$200 000 per year
Mereenie Joing Ventures (oil) - Ngalia Basin	6.0	1981	Up-front payment plus 1 1/2 per cent of well-ahead value.
Palm Valley Joint Ventures (gas) - Palm Valley	3.2	1982	\$500 000 initially plus 1 1/2 per cent of well-ahead
North Flinders Mines (gold) - The Granites	3.0 <u>145.0</u>		No details available
Pancotintental (uranium) - Jabiluka		1982	\$1 million up-front (after ministerial approval); \$800 000 for NLC administration costs; \$1.2 million annually (years 2,3,4) after project approval; \$1.2 million after sale of 3000 tonnes yellowcake per year for the first five years; \$3.4 million on commencement of production; \$500 000 per annum credited against royalties.

Sources: ATSIC (sub.40), NLC (sub.28) and NT Governemnt (sub.77).

14B NUMERICAL EXAMPLES OF A BROWN TAX AND AN RRT

This attachment explains how royalty liability would be calculated under a Brown tax or a RRT regime. Tables 14B.1 and 14B.2 give a numerical example for each royalty using the same project profile. (The hypothetical profile is taken from Emerson (1984, Table 1).

In Table 14B.1 a Brown tax is applied at a rate of 40 per cent per cent. Royalty assessment is based on net cash flow (NCF) for the period: If it is positive, then the developer pays royalty at a rate of 40 per cent; if NCF is negative the government pays a rebate at the rate of 40 per cent. Since total net cash flow over the 10 year period is \$400 million the aggregate royalty under the (40 per cent) Brown tax is \$160 million.

The aggregate royalty for all projects (subject to the same 40 per cent Brown tax) will be 40 per cent of total net cash flow. However, different time profiles of annual net cash flow will result in a different net present value for the same aggregate royalty. In the example of Table 14B.1 the NPV of the \$160 million is \$51.8 million (for a discount rate of 15 per cent).

In Table 14B.2 a RRT is applied at a rate of 40 per cent using a threshold rate of 15 per cent. Royalty assessment is based upon accumulated net cash flow for the period: If it is positive, then the developer pays royalty at a rate of 40 per cent; if it is negative, then the amount is accumulated forward at the threshold rate. For example, in year 0 NCF is -\$10 million and therefore no royalty is payable. This amount compounds forward (as -\$11.5 million) to be balanced against NCF in year 1. In year 4 NCF is \$125 million but since there is an accumulated negative NCF of -\$99.9 million up to that period the royalty base is only \$10.1 million: (\$125 million -\$99.1 million -0.15 (\$99.1 million)).

The aggregate royalty for this project would be \$140.8 million, or 35.2 per cent of total NCF. Although the same project would pay \$160 million under a Brown tax - Table 14B.1 - a more valid comparison would be on the basis of NPV. At a discount rate of 15 per cent the aggregate royalty under the RRT is \$51.8 million. (The NPV of aggregate royalty is the same under both the Brown tax and RRT because the discount rate is the same and crucially, is equal to the RRT threshold rate.)

Table 14B.1: A numerical example of using a Brown tax
(\$million)

	Year											
	0	1	2	3	4	5	6	7	8	9	10	Total
Exploration	10.0	15.0										
Capital expenditure		15.0	100.0	5.0			60.0					
Cash operating costs				20.0	25.0	25.0	30.0	30.0	30.0	35.0	35.0	
Total cash outflows	10.0	30.0	100.0	20.0	25.0	30.0	30.0	30.0	90.0	35.0	35.0	
Cash sales revenue				90.0	150.0	95.0	105.0	85.0	70.0	110.0	130.0	
Net cash flow (NCF)	-10.0	-30.0	-100.0	70.0	125.0	65.0	75.0	55.0	-20.0	75.0	95.0	400.0
40% Royalty (+) or Gov't rebate (-)	-4.0	-12.0	-40.0	28.0	50.0	26.0	30.0	22.0	-8.0	30.0	38.0	160.0

Source: Based on Emerson (1984), Table 1.

Table 14B.2: A numerical example of using an RRT
(\$million)

	Year											
	0	1	2	3	4	5	6	7	8	9	10	Total
Exploration	10.0	15.0										
Capital expenditure		15.0	100.0			5.0			60.0			
Cash operating costs				20.0	25.0	25.0	30.0	30.0	30.0	35.0	35.0	
Total cash outflows	10.0	30.0	100.0	20.0	25.0	30.0	30.0	30.0	90.0	35.0	35.0	
Cash sales revenue				90.0	150.0	95.0	105.0	85.0	70.0	110.0	130.0	
Net cash flow (NCF)	-10.0	-30.0	-100.0	70.0	125.0	65.0	75.0	55.0	-20.0	75.0	95.0	400.0
Accumulated NCF (at 15% threshold rate)	-10.0	-41.5	-147.7	-99.9	10.1				-20.0	52.0		
RRT (40%)	0.0	0.0	0.0	0.0	4.0	26.0	30.0	22.0	0.0	20.8	38.0	140.8

Source: Based on Emerson (1984), Table 1.

REFERENCES

Emerson C 1984, *Mining Taxation in ASEAN, Australia and Papua New Guinea*, ASEAN Australian Economic Paper No. 14, Australian National University, Canberra.

14C COMMENTARY ON ABARE ANALYSIS OF BROWN TAXES

ABARE (1989, p.17) has argued that the application of a Pure Rent (Brown) Tax for risk averse companies would encourage them to engage in greater investments in and mining activities than they would do in the absence of any form of resource "taxation". As presented, the argument hinges on the desire of shareholders to have their exposure to risk reduced and, therefore, their willingness to accept lower expected returns from mining if the activity is less risky. It should be noted that a RRT is the equivalent of a government equity share in the investment equal to the rate of tax specified, so that the extent of shareholder equity is reduced by the proportionate tax rate. The risk associated with the employment of dollar's a worth of shareholder funds is not affected, but the volume of shareholder funds employed is reduced. Other things being equal, this reduces the share of mining industry stocks in shareholders' overall portfolios, and it might be expected that they would attempt to rebalance those portfolios by subscribing additional amounts to exploration and mining (and committing the government to doing the same thing), so that the supply price of capital to the mining industry was reduced.

If the matter could be thought of purely in an Australian context, the argument would have some apparent force but would be subject to an important counter-argument. While it would be true that mining stocks would occupy a smaller share of private asset portfolios, they would occupy a correspondingly larger share of the public asset portfolio. As taxpayers, Australian citizens would stand to gain or lose from the government's possession of these assets in exactly the same way as if they held them themselves. Thus, the application of RRT would have no effect on the average citizen's portfolio of asset holdings. While it would undoubtedly create some redistribution of asset portfolios, it is impossible to determine the effect of this, if any, on the supply price of capital for mining investments.

More important than these relatively technical arguments and counter-arguments, however, is the fact that the relevant asset market is not an isolated Australian market but an integrated global capital market. That is, the question is whether the introduction of RRT in Australia would have any effect on the world supply price of capital for exploration and mining activity. Since there is reason to doubt whether the worldwide application of RRT for mining would have any noticeable effect on the supply price of capital (for the technical reasons discussed above), it is clear that the effect of a RRT being applied in Australia only would have to be regarded as completely inconsequential.

REFERENCES

Australian Bureau of Agricultural and Resource Economics (ABARE) 1989, *Mineral Taxation and Risk in Australia*, Discussion Paper 89.8, AGPS, Canberra.

PART V 3.

CONSTRUCTION AND OPERATING COSTS

CONSTRUCTION AND OPERATING COSTS

Participants identified a variety of costs which they claimed were impeding the competitiveness of mining and minerals processing activities in Australia. This part considers four main categories of costs: the provision of infrastructure (Section 15); transport (Section 16); labour (Section 17); and energy (Section 18).

For some mining projects, the cost of production facilities and supporting infrastructure can represent up to half of total outlays. The question of who should pay for necessary infrastructure – the developer or government(s) – was widely canvassed. The general principle which should pay for attributable cost, while governments should provide facilities which they normally provide on a community-wide basis. Factors claimed to unnecessarily increase infrastructure costs were also identified.

Due to the typically large distances between many Australian minerals deposits and the markets in which the resulting mineral-based projects are ultimately sold, transport costs loom large as an important determinant of competitiveness. In particular, the high cost of Australian coastal shipping and freight rates charged for publicly provided rail services were identified by many inquiry participants as major impediments – especially when it came to decisions about the viability of undertaking further processing domestically (ie adding further value to our minerals). Lack of direct competition in the supply of transport services has been identified as the main reason why costs of water and rail transport are too high in this country.

Labour relations in the mining and minerals processing industries have been characterised by often bitter confrontation, with coal mining in particular having the worst record in terms of working days lost, lost through industrial disputes of any industry in Australia. Shared goals and more co-operative approach are more likely to produce better outcomes for employers and employees alike, and this is more likely to be achieved if conflict resolution and negotiations occur at the level of individual enterprises/workplaces than within the setting of a highly centralised systems.

Energy costs represent a greater proportion of total operating costs for mining and minerals processing activities than for most Australian industries. For some, such as alumina refining and aluminum smelting, they are so important that commercial confidentiality precludes public review of the tariffs charged for the electricity inputs. In general, there is sufficient evidence in the public domain to indicate that the publicly run electricity supply industry in Australia is inefficient, and this flows through to higher than necessary electricity tariffs. Lack of competition is a major reason for this state of affairs. There are also indications that the pricing arrangements for natural gas do not reflect the costs of supply.

15 PROVISION OF INFRASTRUCTURE

Expenditure on social and industrial infrastructure accounts for a large proportion of total project costs often many years before mineral sales occur. In most cases developers should pay for infrastructure which is necessary for the project and government should provide the social infrastructure which it is generally responsible for - such as health, education and law facilities. State government policies for infrastructure responsibilities are gradually evolving towards this division but there are still many differences. Whatever the sharing arrangements, there are a number of factors which unnecessarily increase the costs of infrastructure provided by developers - such as public ownership and control of the infrastructure and financing by up-front contributions.

Mining projects require substantial infrastructure, particularly in remote regions where an existing township or transport linkages are not available. 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 such as housing, town water supply, health and education services are necessary for the supporting township.

The expenditure on industrial and social infrastructure accounts for a large proportion of total project expenditure, often many years before mineral sales occur (See Box 15.1). MIM report (sub. 19, p.3) that mining companies in Australia have built 24 towns, 1900 kilometres of rail, 12 ports, and more than 20 airfields, together with dams and power stations.

Box 15.1 Infrastructure costs

In the case of the Collinsville and Newlands coal developments the cost of infrastructure was more than 50 per cent of the total cost, as follows:

Cost of mine		\$404 million
Cost of infrastructure:		
Towns	\$103 million	
Port facilities	\$ 80 "	
Railways	\$250 "	
Roads	\$ 29 "	
Power and water	\$ 27 "	\$489 million
		<hr/>
		\$893 million
		<hr/>

Source:MIM (sub. 19, p.13)

The central questions in this section are who should pay for infrastructure and, are the costs of infrastructure unnecessarily high?

The Commission has also been specifically asked to consider construction costs in remote areas. This topic is discussed in Section 15.3 and Attachment 15A

15.1 Who should pay for infrastructure?

In keeping with the Terms of Reference, the benchmark for answering this question 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 sharing costs.

In general there will be an incentive for developers to provide most 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 capital and operating costs (including an adequate return on investment).

The bulk of infrastructure is dedicated to the project for example, transport facilities (railways, ports and roads) and townships and supporting services (electricity, water and sewerage). If the developer believes it is profitable to provide the infrastructure - and there are no offsetting costs to other persons or activities - then it is an efficient use of the economy's resources. There is no necessary obligation for 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, police stations) which are ordinarily provided by government and which are for the benefit of the community at large rather than being specific to the mine development. If the developer must 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 against mining just as if there was a tax on mining activity but not on competing investments. This is inefficient.

The distinction between dedicated infrastructure and the social responsibilities of governments is a relatively straightforward rule to apply. However, the argument about who should pay for dedicated infrastructure is often complicated by arguments about the existence of secondary users, external benefits such as tourism and decentralisation, and proposals for governments to pay and then the developer pay back over time.

Secondary users of infrastructure

Many items of transport and other infrastructure are used by others besides the original developer. On this basis it has been argued that the developer should not always pay the full capital cost of dedicated infrastructure.

For example, Alcoa (sub. 16, p.10) state:

There is a general position that specific industry infrastructure requirements should not be funded by the taxpayer. While this general position may be appropriate in many instances, there are situations in which Government should contribute towards infrastructure development ... Therefore, it is appropriate to consider infrastructure investment on a case by case basis rather than adopting a fixed view on the matter.

Alcoa advanced the capital to the Bunbury Port Authority to enable the inner harbour depth to be increased to forty feet. All users of the inner harbour now benefit and the infrastructure may attract new industries to the region (sub. 16, p.10). Similarly, some iron ore projects in WA were able to make use of existing infrastructure provided by the pioneer mines in the 1960s and the substantial investment by Queensland coal mines in rail and power facilities provides a base for further resource and general industry development. Should other users of mine financed infrastructure contribute to the capital cost?

A mining company is no worse-off financially if secondary users pay for their attributable capital costs (such as additional harbour tugs and storage facilities in the port case and additional rolling-stock, signalling and passing loops for the iron ore railway) and provided user charges cover their share of operating costs including depreciation of the joint capital. Any contribution that secondary users make above their attributable costs will reduce the mining company's share of joint costs and improve its financial position.

However, the ownership and control of infrastructure will determine the financial relationship between the developer and other (future) users. Often multiuser industrial infrastructure (such as railways and power generation), although fully financed by the developer, remains under the ownership and control of a public authority because it forms part of an integrated state system. Both the developer and other users then pay user charges to the public authority. Under these arrangements there is no direct link between the secondary users and the mine developer which financed the facilities thereby making it difficult for a mining company to recoup some capital cost. They must rely on the public authority refunding some of their capital contribution either directly or indirectly through lower user charges. In the case of the Bunbury Inner Harbour, Alcoa was refunded \$2 million in 1982-83 (having advanced \$6.3 million between 1969 and 1974) as a result of Worsely commencing operations in 1976 and using the improved harbour (sub. 138, p.1).

It is not inefficient or a disadvantage to developers if there are other users of the infrastructure who do not contribute to the joint capital cost except for their extra capacity and operating costs. The developer chose to provide the infrastructure because it was privately profitable. The situation is no different to an abandoned dedicated railway being used in the future - the original developer will not receive any contribution from the new developer but that did not discourage the original provision.

Tourism and decentralisation externalities

An example of the wider benefits to the economy from mine infrastructure is explained by WMC (sub. 69, p.39):

... in some cases the demands on companies for infrastructure contributions are excessive because governments fail (or do not wish) to recognise the concomitant benefits. Mining has led to the establishment of many flourishing regions of Australia which no longer depend upon mining as the basis of their economy: local support industries become industries in

their own right; tourism expands and so on. Yet this potential is rarely recognised by governments when dealing with mining companies. One simple example is the fact that in 1989-90, over 8000 visitors inspected WMC's Olympic Dam operations, despite the fact that the project was not fully commissioned until the latter half of the year.

Should WMC pay for the full cost of Roxby Downs infrastructure because there are substantial benefits to the economy such as from tourism and decentralisation? One problem is knowing ahead of time that there will be such benefits. In the case of Roxby Downs, WMC can argue for sharing of the costs after the external benefits have materialised but at the outset of the project were not deterred from funding their infrastructure requirements because they expected it to be privately profitable just for mining. Nothing has changed to alter this assessment. It is not inefficient that there has been a windfall gain to the community from tourism. It is a question of equity whether the developer receives any recompense.

Because of the role of mine infrastructure as a positive agent of decentralisation and State development there have been examples of governments adjusting the financial responsibilities of the public to take into account externalities. In some cases the government has permitted lower royalty in return for developers providing certain infrastructure (see section 15.3). The importance that governments place on decentralisation benefits of mine developments is perhaps best illustrated by the Western Australian governments arrangements with the Argyle Diamond Venture. When the developer decided for reasons of economy and local disturbance not to establish a town, but to commute workers from Perth, a payment of \$50 million in lieu was required of the developer.

Since it is difficult to arrange ex-post for the developer to share in the windfall gains to the community from mine infrastructure, the possibility of external benefits should be carefully considered at the feasibility stage and when financial sharing arrangements are negotiated between developers and governments.

The tourism and decentralisation case does not differ in principle from the case of secondary users discussed above. Therefore, to reiterate, it is efficient if the developer bears the full cost of infrastructure even if the township expands into a regional focus not dependant upon the mine or generates a tourist attraction. It is inefficient however, if the developer bears additional costs attributable to tourism and regional growth, or if the cost burden deters mine development and the benefits forgone (to the developer and the wider community) would have been greater. However, in this later case there is no easy way of readily identifying such market failures.

Timing of benefits and costs and the cost of public borrowings

Mining often has a long gestation period before ore extraction begins. This creates a large financial shortfall in the early years of the project. Participants suggested that government provision of infrastructure may have substantial benefits to project cashflow - it may even mean the difference between a viable and unviable project, especially if the imbalance between costs and revenue in the formative stage contributes to difficulties in obtaining financial backing.

The NSWCA (1989) emphasised the adverse impact on gearing ratios and project viability of requirements to make up-front contributions for infrastructure. They suggested that annual instalments, deducted from earnings once production commences, would reduce the "timing" problem, would be financially better for companies under the existing taxation laws, and avoid a common problem of overservicing social infrastructure (because of errors in up-front projections of employment and population growth).

Participants also suggested that initial funding by government would be beneficial because of the lower cost of public capital. For example, MIM (sub. 19, p.34) said that "bond-rate finance should be made available for private enterprise investment in public infrastructure including housing, roads, pipelines, power stations, rail lines, ports and dams".

However, there would be some offsetting costs of government providing the infrastructure and then recouping its investment over time. As the government would be absorbing the downside risk of not recouping its investment (such as through premature closure of the mine or because the developer switches to alternate transport or power facilities) the government would require a premium on investment in the same way as private investors do for their risk element. This would add to the cost of user charges and mitigate the benefit of the lower cost of public capital.

Governments could, and have, reduced the risk to public funds by including clauses in development agreements ensuring the developer uses the publicly provided infrastructure and by establishing public monopolies for services. But both these 'solutions' could negate the benefits to the developer from public provision. For example, contractual arrangements are usually specified on a 'take or pay' basis such that the developer guarantees to meet the fixed costs whether it utilises the services or not and there is no guarantee of supply when the contract terminates. Comalco said (sub. 111, p.1-2) that the take or pay "condition is a long-term and potentially very costly obligation." In the case of restrictions on competition this fosters inefficient public provision and inflates the cost to be recouped through user charges. (See Sections 16 and 18).

In summary, there is no case on efficiency grounds for governments to bear infrastructure costs up front and recoup it from developers at a later date. If there was, it would apply for all activities and not just mining. In fact, government financing and ownership of infrastructure may prove to be more costly.

15.2 State government policies on financing of infrastructure

During the last twenty five years state government policies on provision of industrial and social infrastructure for mining can be described as diverse and ad hoc. The degree to which the public contributes to the costs (and whether it maintains ownership and control) have varied considerably, both within and between states. Infrastructure policies have been determined largely on a case-by-case approach and heavily influenced by State government budgetary positions, an assessment of what the project could bear, and the use of infrastructure provision as a state development instrument and *de facto* royalty. This is illustrated by a number of examples below. In recent years more rational arrangements have evolved.

In the 1960's and early 1970's the iron ore companies in the Pilbara region of Western Australia were required to fully fund all industrial and social infrastructure. The railways, ports and power grids formed no part of the state's integrated system in the south-west and so ownership and operation remained with the mining companies. At the time, the State government had limited financial resources and the mining projects were sufficiently profitable to bear the costs.

In contrast, there has been extensive public funding of infrastructure for the more recent North-West shelf gas project. The justification being the greater availability of public capital through special borrowings within the Loan Council framework, the long term benefit to State development from the project, and the risk to the speed and viability of the project without public involvement.

In general, the Western Australian infrastructure policy is based on the distinction between dedicated infrastructure and joint social responsibilities. The WA Department of Resources Development (sub. 48, E3) stated:

In recent years the State Government has recognised the justification for State funding of capital and operating costs for hospitals and educational and law enforcement services. Other social infrastructure is now usually jointly funded by the developer, the State Government and the Local Government Authority following negotiations between these parties.

In support of requiring developers to contribute to the cost of 'other' social infrastructure the WA Government said (sub. 48, p.7) "the share borne by the company is regarded as being a cost that would not otherwise be borne by the public purse in the absence of the project and is therefore a private cost." It also expressed the opinion that industry should bear the costs of infrastructure necessary to reduce social and environmental impacts such as heavy vehicle by-passes and road widening.

The infrastructure policies of both the Queensland and Northern Territory (NT) Governments have changed from significant involvement in infrastructure provision towards policies of less public investment. Under Commonwealth administration, the NT believed it was necessary to encourage mineral development within its boundaries and spent considerable amounts on the township for the Gove bauxite-alumina project and transport facilities for the Frances Creek iron ore mine. Financial constraints since self-government have curtailed the Territory's desired contribution to infrastructure. For example, The NT government stated (sub. 77, p.19):

A small revenue base does not allow appropriate assistance to industry or public companies for establishing the necessary infrastructure projects. The Commonwealth's lack of commitment to infrastructure funding, eg the railway connection Darwin - Alice Springs or funding for roads in remote areas hampered faster development of the mining sector in the Northern Territory.

Queensland was very generous with its encouragement to mining activities in the early 1960s. Then, from 1965 to 1988 most companies were required to make full payment for industrial infrastructure and case-by-case sharing arrangements for social infrastructure were negotiated. MIM expressed concern (sub. 19, p.13) that infrastructure attributable to the project was so broadly defined that the developer paid much more than necessary.

In 1989 the Queensland Government revised its rail infrastructure policy for coal such that companies would only be required to finance dedicated rail spurs instead of the previous requirement to fund the entire cost of the permanent way and rolling-stock. However, this may be a cosmetic rather than a significant policy decision. Since an extensive rail network exists in Central Queensland as a result of past coal developments the new infrastructure policy may not, in practice, have any significant effect - since any new development will probably require little more than spur lines and rolling-stock.

For the three major resource developments in South Australia in recent years the government has contributed towards both industrial and social infrastructure. The scale of its commitment to the Roxby Downs project substantially exceeds its involvement with the Cooper Basin oil and related Stony Point liquids projects. The delineating criteria in these cases appears to be the ability of the project to 'bear the burden'.

The NSW Government introduced the Infrastructure Financing Policy in 1982 with the intention of regularising an emerging system of financial contributions paid by resource developers to local governments to assist in overcoming funding shortfalls for urban and social infrastructure. However, as described by the NSW Government (sub. 217, p.11) it has proved unsatisfactory:

This scheme had a high up-front cost component and had several disadvantages, not the least of which was that it was not tailored to suit the individual communities concerned. It is now generally agreed that the 1982 policy is inadequate, and accordingly, the policy is under review.

Oakbridge commented (sub. 32, p.19) on a specific problem with the financing arrangements with Local Councils:

The payments have gone into the consolidated revenue of local councils and have not been applied specifically to alleviate those strains directly associated with mine development. This lack of direct accountability indicates another rent-seeking activity rather than a genuine attempt to address an acknowledged difficulty.

The NSWCA (sub. 45, p.31) was concerned that the infrastructure financing policy in conjunction with the land valuation method for local government rates is "double-dipping". Although mines are predominantly located on unserviced rural land the coal industry is rated on an output basis which substantially increases rates above what comparable land used for other purposes is charged. The higher charges cannot be justified as payment for servicing the land, since under the infrastructure financing policy the mine developer already contributes the full cost. The output valuation basis for rates is in effect a resource tax additional to those imposed by the other levels of government (see also Section 13.4).

15.3 Excessive costs of infrastructure

This section seeks to determine if there are any factors which unnecessarily increase the cost of infrastructure provided by mine developers. Some of the factors identified are under the control of governments. Concerns about the level of exchange rates and interest rates are discussed separately in Section 19.

Remote site premiums

Infrastructure costs are higher in remote areas because of higher construction costs and the need to provide larger storage and other on-site facilities than normally required in developed regions. The issue is whether the remote site premiums are higher than necessary because of impediments under the control of government or they actually reflect the opportunity cost to the community of committing labour and capital to these areas.

The Commission was specifically asked to consider the issue of construction costs in remote areas. This is discussed in Attachment 15A. The limited information available to the Commission indicates it costs more to construct a project in remote locations than in more developed locations. Reasons for this include: the need for larger storage facilities and other on-site services to cope with less frequent and certain deliveries; the transport cost of materials used in construction; inefficiencies in the construction industry because of barriers to competition such as local content requirements; and higher labour costs because of labour union arrangements.

Remote site construction costs will always be higher because of the distance element. The other reasons for higher remote site costs are partly under the control of government. These issues will be considered in detail in the Commission's concurrent inquiry into Construction Costs of Major Projects - to be released on April 18 1991.

Public ownership and control

Oakbridge said (sub. 32, p.19) "coal companies are prepared to incur the capital cost of major infrastructure provided they have ownership or management control of the assets". Alternatively, under public ownership and control of industrial infrastructure such as railways and electricity generation the mine pays the operating authority user charges such as rail freight rates and electricity tariffs. Sections 16 and 18 present evidence that not only are user charges inflated because of public authority inefficiencies but they are sometimes set above the (inefficient) cost of supply - excess charges. In many cases the construction of the infrastructure is also organised and/or undertaken by the public authority and the expense charged to the developer.

WMC explained (sub. 69, p.39) the additional costs that public ownership and control entails:

... charges are levied on the basis that all work will be carried out by the relevant government authority and the contributions sought from the company are based upon the costs incurred by these authorities. The Commission has previously identified inefficiencies among such agencies. Thus, the problem for the developer is that often the contributions sought are based on costs inflated through inefficient practices. Inefficiency in construction is

compounded by inefficiency in operation, to which the developer often has to contribute also. In some instances such as telecommunications, railways or electricity, specific prohibitions apply which prevent the developer seeking supply of equivalent infrastructure on competitive terms.

The choice between public or private ownership of dedicated mine infrastructure has primarily been determined by the degree of integration of the facilities with existing publicly owned infrastructure. For example, the privately owned Pilbara region railways are geographically divorced from the government rail network in the South-West of Western Australia whereas Queensland rail lines financed by coal companies also have grain traffic and therefore public ownership is seen as necessary to ensure access for other rail traffic and to control pricing.

The issue of whether to have a public or private monopoly for provision of infrastructure services ignores the fundamental reason for the inefficiencies identified in the operation of many government business enterprises in Australia - lack of competition. In some cases only one supplier may be able to survive in the marketplace (such as the permanent way for railways and the transmission grid for electricity) but in many other areas there is scope for more than one supplier. Competition will ensure more efficient supply (see IC 1990).

A further disadvantage of public involvement in infrastructure provision, is the requirement to meet state design and quality standards. These standards are often inappropriate for mining ventures and increase costs. For example, Freebairn and Trace (1988, p.22) observes in the case of Queensland rail lines for coal transport:

there is only limited evidence that the choice of technical standards is heavily influenced by commercial criteria. Rather, engineering standards and convenience of the rail authorities are given most weight. In many cases it may be that a lower level of technical specification would reduce overall costs without reducing the quality of service provided.

Overestimating infrastructure contributions

When the responsibility for the construction of the infrastructure resides with the government but the developer finances the cost, great care needs to be exercised to accurately determine the developers attributable share. Many such contributions are made up-front on the basis of estimates. For example, up-front contributions by coal developers in NSW to local councils for social infrastructure include a per capita grant to cover costs of increased population in the mine area. Because of the up-front nature they are by necessity based upon projections of employment and population growth. But the actual net migration to a region may differ substantially from the projections. In the case of some Hunter Valley coal mines the population growth projections failed to materialise because many of the workers commuted from nearby jurisdictions and there was little increase in the regional population. There was also high unemployment in the region. The effect was that developers paid much more than their attributable cost.

Oakbridge commented (sub. 32, p.19) on the above situation:

There have been some welcome improvements in recent years. At least one local council, for example, has indicated a willingness to negotiate payment based on actual rather than anticipated net migration, when the employment occurs. Nevertheless, the system would benefit from clearer guidelines from government in respect of grants, and more accountability in local councils as to the expenditure of these funds.

There is also a danger that developers are charged too much for estimated changes in capacity of existing public infrastructure such as electricity generation and sewerage facilities. To be cost effective, capacity adjustments often need to be in large, discrete increments. Mine developers should only pay their attributable share. Likewise, developers cannot be expected to contribute towards any 'catch-up' investment resulting from past deficiencies in service.

Should the infrastructure contribution of the developer be made up front or charged once it is known? WMC (sub. 69, p.40) drew notice to the different method of calculating capital contributions for public railway expenditure in Western Australia and Queensland: "the former based on actual equipment acquired, the latter based upon Queensland Railway estimates of the capital requirements and incorporated into freight rates." There is a trade-off between making errors using up-front estimates and the risk to public finances of an abandoned development if the cost is charged after the government has paid it.

A mixture of both approaches appears best - either payment for the full estimate can be made up-front but subsequently adjusted when actual costs are known, or part payment could be made (at least to cover government borrowing costs) and the remainder collected under contractual arrangements once actual costs are finalised. For example, the NSWCA believes (1989 p.21) that:

... the up front payments system should be replaced by a system of agreed annual instalments, made after the mine commences production and calculated or adjusted on the basis of actual impacts.

Infrastructure provision as a *de facto* royalty

The Queensland Coal Association stated (sub. 70, p.19):

The Association believes that Government calls on company funds for construction and upgrading of infrastructure have on occasion exceeded the actual capital costs involved. These excess charges have constituted another tier of royalty collections.

Similarly, because of the implicit royalty represented by excess user charges for railway and port facilities and the enduring benefit to the community after the mine has ceased operations, the QCA (sub. 70, p.18) proposed "if infrastructure is company funded but government owned, the developer's contribution should be offset in future royalty payments."

For capital expenditures to be classified as *de facto* royalties they must be made for facilities that a developer would not provide under normal commercial circumstances or for facilities that government would normally provide. In practice it is not easy to determine this as it is often not a choice between whether a facility would or would not be provided by the developer but rather the government has insisted on a larger port, wider airstrip or higher quality health and education services than the company would have chosen for its own needs.

The Goldsworthy - Nimingarra iron ore project is an example of government explicitly forgoing royalty income in return for infrastructure provision. In 1972 a higher royalty was imposed than that applying for deposits of comparable quality in the Pilbara on the reasoning that the rail, port and town facilities had been provided by earlier projects. In the 1980s the company lobbied for a reduction in the royalty rate and the Western Australian government agreed, in return for the company building a pipeline and water tank to State standards.

Most cases of using infrastructure provision as a *de facto* royalty are not so clear cut. Bradley (1986 p.173) considers that the \$2 million spent by the Argyle developers on education, hospital and recreational facilities in Kununurra would normally have been provided by the various levels of government and were not necessary for the project's viability. The question is whether the profits-based royalty for the project may have been higher if the developers had not contributed to this social infrastructure. Bradley also assessed there was \$1.5 million spent by the Worsely gold venture on infrastructure that was probably unnecessary or normally provided by government, and was more than likely influenced by the exemption of gold from royalties.

Taxation

Section 13, which deals with the treatment of mining within the structure of taxes and tariffs identifies a number of arrangements which influence the cost of infrastructure.

One feature of the company tax system which increases the cost of infrastructure is the lack of deductibility for expenditure on housing and welfare facilities not located near the minesite. This increases the cost of locating such facilities at a port (where it may have more benefit to the community both now and in the future).

Other taxation arrangements which unnecessarily increase the cost of infrastructure provision are: local government rates which exceed the cost of publicly provided services (particularly when up front payments for community infrastructure have already been made) and; tariffs on imported components needed for infrastructure.

15.4 Conclusions

The financial responsibilities for development infrastructure are crucial because of the significant share of project costs that they account for. There is an incentive for developers to pay for the infrastructure necessary to ensure mine operation such as dedicated transport, power and water facilities and a supporting township. Therefore, the project should bear these costs. However, the government should provide the social infrastructure such as health, education and police facilities which it generally does elsewhere.

In some cases there may be other regional users of mine infrastructure. However, if the developer's decision to fund the infrastructure is not affected by the possibility of other users then there is no adverse efficiency effect if the 'secondary' users do not share the joint costs. It is a question of equity or fairness whether the developer receives any contribution towards the capital cost and this may depend upon whether the infrastructure is publicly or privately controlled.

In some cases infrastructure may not be privately profitable for the developer to provide but the benefits to the economy may exceed the cost of the infrastructure - a port for use by several current and future activities is an example. Although this 'market failure' provides a case for government provision or assistance in practice market failure is difficult to identify.

The degree of financial responsibility assumed by the developer and government for mine related infrastructure has varied considerably between States and over time. While infrastructure financing policies are becoming more rationally based, a number of problems continue to exist in this area. For example, there is scope for a reduction in the uncertainty, at the planning stage, of how much a developer will be required to contribute. The negotiation stage is also highly dependant on the degree of bargaining power exercised by Governments, especially Local Councils.

Finally, there are a number of features which unnecessarily increase the costs of infrastructure for developers. These include: making up-front estimates for infrastructure contributions; inappropriate state design and quality standards; and certain taxation arrangements and inefficiencies in remote site construction.

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16 TRANSPORT OF MINERALS

Goods gain their value, in part, by being transported to where users require them, which is why transport services play a vital role in the economy. Given the economic geography of Australia, which often dictates that the products of the mining and mineral processing industries must be transported over vast distances to reach their customers, it is more important to Australia than to many other nations that we have efficient transport and handling systems. Yet Australian transport services are often characterised by excessive costs compared with what an economically efficient system would be capable of delivering. Coastal shipping and rail - the two domestic transport modes on which mining and mineral processing activities are most dependant - are particularly poor performers when judged by the economic efficiency yardstick. Only road transport provides competitive pressures to keep freight rates down (and there are problems even in this area, with under recovery of road-related costs in the case of heavy vehicles). However, competition from road can only act at the margin when it comes to moving the large volumes over the vast distances usually involved (so its restraining effects on rail and coastal shipping freight rates are limited). Much more could be done in Australia in terms of making our transport and handling systems more efficient, especially in the areas of rail and coastal shipping/the waterfront.

Transport has been identified as a major impediment to the Australian economy (eg estimates in the Commission Annual Report demonstrate that \$10.7 billion of the total \$22 billion increase in real GDP resulting from selected microeconomic reform would be generated by reforming the transport sector (IC 1990, p.6)), and given the importance of Australia's transport network to the mining and minerals processing industry, it has also been seen as one of the major impediments to the industry. This section examines how coastal shipping, international shipping, port authority operations, and road and rail services affect the competitiveness and efficiency of the mining and minerals processing industries. The following participant's views highlight industry concerns in relation to the efficiency of Australia's transport network.

Oakbridge Ltd (Oakbridge, sub. 32, p.9) commented:

Excessive charges for transport and handling services are a direct drain on competitiveness and perhaps the most significant impediment to industry development ... these services need to be provided on a commercial basis and not by misuse of monopoly power to protect inefficiency or to cross-subsidise other functions.

In respect of coal the Joint Coal Board (JCB, sub. 18, p.41) stated:

Coal is a bulky commodity with a low value to weight ratio and transport costs represent a significant component of fob and cif costs. For example, in the case of NSW steaming coal exports, transport and port charges represent on average 25-30 per cent of the fob value and range up to 40 per cent for mines in the Gunnedah and Ulan areas. It is important, therefore, that the industry take advantage of opportunities to reduce transport costs as one way of improving its international competitiveness.

Barrack Speciality Metals (sub. 75, p.10) stated in general:

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.

Thus, excessive transport costs were seen as factors impeding the development of the mining and minerals processing industry, while encouraging the export of raw materials rather than adding value by further processing.

16.1 Coastal shipping and the waterfront

Coastal shipping represents, in most cases, the only feasible means of transporting bulk minerals over long distances, for either inputs to subsequent stages of production (as in transporting iron-ore for steel production), for further refining (as in the case of transporting bauxite to alumina smelters), and for transport to port facilities suitable for export.

Australian shipping costs are much higher than for many overseas mineral producers. The Commonwealth government's program of structural adjustment to improve the efficiency of the economy, has developed strategies aimed at raising the performance of blue-water shipping and the waterfront.

While these initiatives may raise productivity, by reforming some of the fundamental structural problems of the coastal shipping and waterfront industries such as restrictive work practices, there is concern that the reforms do not attack one of the main reasons for excess shipping costs namely, the lack of competition. For example, MIM Holdings Ltd (sub. 19, p.17) submitted that:

Australian coastal shipping is in a unique position, being one of the few sectors within the economy that is not facing market competition from international sources.

In fact, its privileged position guarantees that it faces virtually no direct competition at all.

The dimension of the problem is shown by the relative shipping rates - to ship refined copper from Townsville to Yokohama or London costs approximately A\$60 per tonne, whilst from Sydney to Auckland by Australian shipping costs A\$130 per tonne.(MIM, sub.19, p.17)

It should be noted that all of the major minerals and energy shippers own their own coastal trading vessels, although some are operated on contract. BHP Pty Ltd (BHP) owns more vessels than any other single company, seventeen in all, although some of these are not wholly dedicated to coastal

trade.¹ Regardless of whether vessels are privately owned or leased, companies are not free to negotiate their own conditions on labour and must conform to the standards prevailing in the shipping industry. Thus although utilisation of private vessels enables the company to minimise some costs associated with coastal shipping, they are not free to use the most efficient labour-capital mix.

As an example, BHP (sub. 67, Chapter 3, p.12) submitted that unnecessarily high coastal shipping costs arise:

... from the requirement to use relatively inefficient Australian flag vessels compared to foreign flag vessels, for example, when transporting manganese ore from Groote Eylandt to Temco's ferro alloy plant at Bell Bay, Tasmania. In this example, it is estimated that Australian flag vessels cost over 35 per cent more than would a foreign vessel. For this route foreign vessels are also much more readily available so that solely increasing Australian competitiveness does not necessarily overcome the problem. Such additional costs are a real detriment to increasing manganese ore processing at Bell Bay.

In contrast to the generally expressed view that coastal shipping operations in Australia are an impediment to efficiency and competitiveness in the minerals industry, Pasminco said (sub. 89, p.48) that:

Pasminco's use of coastal shipping is largely limited to short sea routes, ie transit times of no more than 3 days. For these short haul voyages there is, it is suggested, little difference between the costing of a foreign flag vessel and an Australian crewed vessel, now that the manning and award conditions on Australian vessels have been restructured, together with an increase in international market rates.

As an example, Pasminco employed two foreign flag vessels in September 1989 to move zinc concentrate from Port Pirie to Risdon. The cost per tonne of concentrate was almost identical to the cost of moving the same material in our own vessel, 'Zincmaster'.

Excessive costs

Concerns about the high cost of water transport cover both the ship-based and the shore-based components. To this end there have been at least twelve inquiries into the waterfront since World War II, all of which have highlighted inefficiencies in the industry and suggested recommendations for improving efficiency and competitiveness.

¹ BHP Transport Ltd a wholly owned BHP subsidiary moves some 40 million tonnes of cargo annually, operates an Australian fleet of seventeen vessels, and charters vessels world-wide. It has at least four vessels dedicated to overseas trading in bulk commodities and at least eight vessels dedicated to transporting bulk commodities on coastal shipping routes.

There are three broad categories of waterfront charges: ship-based costs, shore-based costs, and port and related charges. The IAC (1988b) estimated that ship operating costs represented on average 83 per cent of wharfgate-to-wharfgate costs for dry-bulk cargoes such as coal, iron-ore and bauxite. This does not mean that less effort should be directed towards reform and improved efficiency of the shore-based segment or ports. Many ship-based and shore-base costs are interdependent, such that improved efficiency in shore-based activities may lead to reduced costs of ship-based activities. In addition the Commission identified the high price of shipping as a significant barrier to further processing of Australia's minerals.

In addition to higher transport charges because of coastal shipping and waterfront inefficiencies, competitiveness is also impeded indirectly through delays at ports due to industrial unrest, inadequate storage facilities and queueing problems. The inability to supply on time, and with products in appropriate condition will hinder export sales and reputation, just as quickly as will high prices.

Ship-based costs

The IAC (1988b) also estimated that the main components of ship-based operating costs (excluding port charges) for a 100 000 dead weight tonne dry bulk carrier were capital (39 per cent), crew (26 per cent), fuel (18 per cent) and other (eg repairs and maintenance (17 per cent)). Potential cost savings were identified for each of these areas and ranged 21 to 27 per cent.

There is no effective competition from foreign-flag vessels in Australian coastal shipping. Although, the *Navigation Act 1912* does not totally reserve the coastal trades for Australian vessels, foreign vessels are not permitted to operate unless they obtain a license. To do this they must satisfy requirements governing amongst other things, crewing levels, wage rates and conditions of service. Foreign vessels have not been prepared to satisfy these conditions because the extra cost exceeds the extra business it could access.

In this regulated operating environment, with little competition from foreign flag vessels, there is little incentive for Australian ship operators to contain costs and hence, maritime unions have been able to establish work conditions far more generous (and expensive) than apply to foreign-flag vessels.

Shore-based costs

The main components of shore-based costs comprise stevedoring (loading and unloading cargoes) and associated activities (for example stockpiling and storage). The Bureau of Transport and Communications Economics (BTCE 1988, p.57) estimated that shore-based costs account for 25 per cent of total Australian coastal shipping costs on a wharfgate-to-wharfgate basis for bulk commodities. Although these costs vary considerably depending on factors such as type of bulk commodity and the distance from mine to port.

Stockpiling and storage costs are important components of shore-based costs. Mineral stockpiles require large amounts of land close to the port where it is often expensive. These costs vary between states and for different minerals. For example, in 1985-86, the average cost of stockpiling and loading coal in NSW was \$4.86 per tonne and is believed to be substantially higher than that of privately operated facilities in Queensland. The BTCE (1988) estimated that the cost of storage and loading for iron-ore was \$0.50 per tonne.

The lower costs in Queensland (mainly coal) and in Western Australia for iron-ore are mostly due to the specialised nature of the ports. In contrast, Oakbridge (Transcript, p.1025) said that, "ports in NSW were multiproduct ports and do not have the facilities for storage of coal, only for marshalling of cargoes and so the horizon times for transfer of coals from the stockpile to the port ... [act as] a constraint."

Ports and port facilities

EXXON Coal and Minerals submitted (sub.97, p.5) that port and associated costs on average account for 26 per cent of fob cash costs in NSW and 21 per cent in Queensland.

The Inter-State Commission (ISC 1989) in its report on the waterfront found that port authority efficiency was just as important as reform of stevedoring operations if the full potential benefits of waterfront reform were to be achieved. "Major ports are too far apart for there to be real competition between them and competition between smaller ports which are closer together led to poor utilisation of facilities."

The Cement Industry Federation Ltd (sub. 46, p.10) expressed the view that:

The cost of coastal shipping in Australia and its associated port and stevedoring charges is inhibiting the development of the Australian industry in a way which would make it more cost competitive. The rise in port charges relative to total shipping costs has become particularly noticeable. These costs have in the past inhibited the building of larger plants designed to service Australia's main markets by sea.

In Australia, a variety of arrangements apply to the delivery of waterfront services to the minerals industry. Some companies own and operate their own wharves while others are dependant upon publicly provided facilities. Some employ wharf and loading labour on a specific site agreement basis while a number of bulk minerals loading facilities are subject to general stevedoring employment conditions. Most mineral shippers are to some degree dependant upon publicly provided or regulated services, and many are subject to general waterside operational and employment conditions.

Charges are levied on a vessel for entering and berthing at the port, and on cargo loaded and unloaded. Charges are also levied for the use of port facilities such as electricity, telephones, and water and garbage disposal.

Australian ports have a history of being inefficient, characterised by poor work practices, and poor management. In particular, there is low productivity of labour and capital equipment, over-servicing by tugs, charges unrelated to the cost of services provided and poor integration with other services as reflected in truck queues at terminals and rail receipt depots.

One recently released study by the Bureau of Transport and Communications Economics estimated that port delays cost the economy more than \$1 billion² in 1988, most of which was eventually borne by consumers through price increases.

Port costs vary greatly between the states, and among ports within a state. In particular the Port Kembla coal loading facility has been severely criticised for its lack of efficiency compared to other New South Wales ports, Queensland facilities and the privately owned iron-ore operations in Western Australia.

For example, Oakbridge stated (sub. 32, p.11-12) that:

Ship loading at Port Kembla is intolerably inefficient. The MSB [Maritime Services Board] owned loader is grossly overmanned with approximately two to three times as many employees per tonne loaded as the privately owned Newcastle loaders. In addition, shippers bound to use Port Kembla commonly incur large demurrage costs.³ Until management and general efficiency at the port is improved, coal producers on the South Coast and in the south-western and western coalfields will continue to be reluctant to undertake further mine development.

... In addition to these excess charges, the slow turnaround of vessels has induced some shipping companies to charge \$0.50-\$1.50 per tonne more for westbound voyages out of NSW ports than they charge for the major Queensland coal ports, in spite of the longer distance from Queensland. This differential bears directly on returns.

Oakbridge estimated (sub. 143, Attachment 2) that for New South Wales, port costs for coal in 1990 ranged from \$3.78 per tonne ex-Balls Head to \$5.78 per tonne ex-Port Kembla. This compares with a range for Queensland of \$2.93 per tonne ex-Barney Point to \$5.00 per tonne ex-Fisherman Island (Brisbane).

In addition to port inefficiencies which raise the cost of service, many users contended that charges are set above the (inefficient) cost of service.

For example, Pasminco Ltd said (sub. 89, p.43) that:

It is and has been the policy of Port Authorities to levy charges on the basis of 'what the trade can bear' and accordingly these charges have little relationship with the cost of providing the service. The charges are rarely equitable and as a consequence cross subsidisation abounds.

CRA Ltd submitted (sub. 73, p.85) that the charges levied by the Maritime Services Board bear little relation to costs resulting in the coal industry paying approximately \$10 million more in statutory charges than it should. Similarly, MIM estimated (sub. 19, p.16) that Queensland special harbour dues contain *de facto* royalty or resource rent tax of up to \$1 per tonne or approximately 40

² Half this amount was incurred through late ship arrivals, port congestion, customs congestion and industrial disputes, while the other half was mainly the result of interest costs on excess stocks importers were forced to hold to make up for delays and the rather more fanciful cost of forgone export sales.

³ The demurrage cost is the rate or amount payable to the ship owner by charter for failure to load or discharge a ship within the time allowed.

per cent of the typical harbour dues rate. However, the Queensland Government submitted (sub. 55, p.20) that in Queensland, the Port Authorities and the Harbours Corporation are expected to be self funding public enterprises. Port charges are levied at rates set to recoup the costs involved in running a port.

Recent reforms and initiatives

Problems with the shipping sector are not unique to the mining and minerals processing industry and are inherent in all industries whose very nature involves the use of shipping both domestically and internationally. To this end, there has been a number of inquiries in recent years into the efficiency and competitiveness of these services.

These inquiries have proposed a myriad of reforms to the waterfront and coastal shipping, with the ultimate aim of improving efficiency primarily through modification of work practices and the introduction of competition.⁴ A common theme to these inquiries was that significant cost inefficiencies existed because of the absence of competitive forces in the supply of maritime services. For example, the IAC (1988b) concluded that if international freight rates applied for the Australian coast trade, then in most years, freight rates covering the ship and shore-based segments of the industry would be 20 to 50 per cent lower.

Since that time, the Federal government has initiated various strategies to address the problems and recommendations of these reports. State governments have also investigated reform of their ports. These initiatives are detailed in Attachment 16A.

As a result of Government initiatives in recent years the Australian coastal shipping industry has made significant efficiency gains. Crewing levels for new ships were reduced from the high 30s to 26, then to 21, and are proposed to reach 17/18 in the future. At the same time there has been an introduction of multi-skilling, improved training opportunities, and the introduction of tax incentives for the purchase of new ships.

The shipping and waterfront reform strategy illustrates a commitment to improving industry performance. The unions have made important concessions which would reduce crewing on new ships to levels more in line with those of OECD countries and have also agreed to review 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. The Waterfront Industry Reform Authority task force estimated that the reductions in ship operating cost resulting from these initiatives will ultimately be of the order of \$50 million annually.

The Government's \$154 million waterfront assistance package is contingent upon satisfactory agreement being negotiated on a wide range of issues, many of which are 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 structural change in these industries.

⁴ These inquiries into the waterfront include among others; 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.

Participants views on recent reforms and the scope for improvement

AMIC commented (sub. 29, p.9) generally on recent waterfront reforms in the following terms:

The 1989 shipping reform package will see a reduction in crew numbers on ships and tugs, government fiscal benefits to the shipping industry for capital items and early retirement packages, some downward movement in the crew/berth ratio that exists across all sectors of the Australian shipping industry and some minor changes to coastal trade permits within the restrictive cabotage policy. None of these reforms will result in any structural change within the industry, rather it will be an on-going "steady as she goes" result with all Australians being required to continue to contribute to an inefficient Australian shipping industry through higher cost structures for goods directly or indirectly in contact with the coastal trade and the Australian towage industry.

In its first six monthly report the Waterfront Industry Reform Authority (1990a) indicated that the process of restructuring the nineteen awards in the industry was lagging behind schedule, with the unions concerned avoiding negotiations that would result in a reduction in employment conditions. The continued delays in reaching consensus in the reform process resulted in Conaust (the largest stevedoring company in Australia) setting aside the Federal reforms, and withdrawing from the Association of Employers and Waterside Labour (West Australian 10 July 1990, p.5). In the judgement of the managing director of Conaust, Captain Richard Setchell, "National Terminals has not wrested enough reform from the unions - and therefore cannot promise enough productivity improvement - to deserve its share of the fund" (The Australian, 7 November 1990, p.8). The more recent WIRA six monthly report stated that continued negotiations on a draft Stevedoring Award, plus issues concerning enterprise agreements, regional ports, and bulk grain, had been the focus of the Authority's activities and direct negotiations between the Parties over the last twelve months (WIRA 1990b). However, in comments attributed to the Prime Minister, (The Age, 21 December 1990, p.1) the pace of reform on the Australian waterfront is too slow. This slow pace of change is not only inhibiting development in the mining and minerals processing industries but also the economy at large.

MIM (sub. 19, p.17) expressed the view that:

Whilst the majority of bulk mineral shipping terminals are not affected by these proposals [of the Waterfront Industry Reform Authority], the NSW coal terminals at Port Kembla and Newcastle will benefit directly.

Further reform, particularly in manning levels, remains essential - the Waterfront Industry Reform Authority (WIRA) proposals should be seen as the catalyst for further improvement in waterfront productivity and efficiency.

Our trading partners are clearly most unhappy with the level of waterfront dispute in Australia over the past decade.

There is now some prospect of improvement, but substantially more needs to be done.

AMIC also commented (sub. 29, p.60) on whether any productivity improvements would flow through to lower freight rates:

Reductions in industry cost structure flowing from the recommended manning reductions and other initiatives can be retained by ship operators/managers with virtually no incentive to pass these savings on to the user. The proposals do not assist shippers unless they own or operate their own ships; they do not help the customer who has to rely on the market for shipping services. There is no pressure on Australian coastal operators to provide a competitive service or a least-cost service. There needs to be a market oriented coastal shipping industry which is responsive to commercial factors.

In regard to the towage industry reforms, AMIC said (sub. 29, p.58) that:

The results stemming from the Towage Industry Review Committee (TIRC) report are an important contribution; however, the Council believes it is imperative that reduced crewing must be supplemented by broader more significant industry reforms ... no mechanism exists within the present towage industry structure to provide for cost savings created from the reduced crewing arrangements and other changes to be passed on to users.

Conclusion

Despite improvements in productivity in recent years and 'in principle' agreements that may bring further gains the industry cannot afford to be complacent. Australia is starting from behind and must improve faster than the international community if the competitiveness of users is to improve. The effectiveness of reform will be gauged by whether the competitiveness of Australian shippers is improved relative to, say, OECD shipping operators.

The reforms achieved to date and proposed for the future have been undertaken within the existing framework of no direct competition. Most users judge that worthwhile and enduring reform will only come through fundamental changes directed at exposing the industry to greater competition (see Box 16.1). Greater competition would induce appropriate changes to institutional practices and provide the same incentives for improved industry performance which apply to most other Australian industries.

If Australian industry is to benefit from the reforms, the cost savings must be passed on to the users in the form of lower freight rates. The past and present strategies for improved efficiency appear to give no guarantee that this will occur. Without competition it is probable that some of the benefits of reform will be appropriated by the industry through higher wages, improved work conditions, higher profits and the emergence of alternative inefficiencies. The Government's plan to use the Prices Surveillance Authority to monitor coastal shipping rates is considered to be an ineffective tool for ensuring that all cost savings are passed on as lower freight rates.

More competitive arrangements in coastal shipping and waterfront activities are necessary to create an incentive for continued cost efficiency. 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 costs and those of its competitors is likely to widen. This is best highlighted by the WIRA process due for completion three years after its instigation and with no guarantee of successful implementation of the 'in principle' agreements.

Analysis in Appendix F, Volume 2 estimates that if inefficiencies in coastal shipping and waterfront activities are removed Gross Domestic Product would increase by \$700 million. In particular the mining and minerals processing industries are estimated to increase output by 0.3 and 1.4 per cent respectively.

Box 16.1 Recommendations by AMIC on waterfront and shipping reform

The AMIC submission said that there was a need to: provide a competitive coastal shipping market with assistance based on a margin of preference; establish company/enterprise based employment in the shipping industry; reduce crew berth ratio on Australian ships; establish "greenfields" crewing arrangements for Australian flag shipping; establish more cost efficient and equitable Commonwealth Navigation Aids arrangements; remove fuel excise from coastal shipping; reform operating and structural elements of the towage industry; abolish licensing arrangements and guaranteed returns for towage operators by some port authorities; abolish cross-subsidisation of port activities and establish cost recovery principles based on user-pays; improve public port facility management and efficiency with employment levels based on real operational requirements; maintain international competitive shipping environment and expand to encompass trans-Tasman trade; and ensure shipping standards covering technical, safety, and pollution are consistent with trading partners and international practice.

Source: AMIC (sub. 29, p.54)

16.2 International shipping

The effect of international shipping on the competitiveness of the mining and minerals processing activities is illustrated by the following comment (Peterson 1986, p.53):

The minerals industry must have access to internationally competitive shipping enabling it to land minerals in world markets at competitive prices. Without such competitive prices, we simply cannot sell. Without reasonable margins on our sales and reasonable returns on investment, the mining industry will be unable to continue its performance.

Recent studies have identified potential cost savings in the services of international conference lines used to transport exports and in trans-Tasman shipping.

International liner shipping is dominated by cartels - called conferences - which set charges and sometimes schedules, and are exempt from certain provisions of the Trade Practices Act. Non-conference competitors can be disadvantaged through conference control of terminal facilities, through cabotage-type arrangements in some countries, through union support in Australia for the Australian National Line (a conference member) and through financial support in many countries for state-owned conference members. The BTE (1986) estimated that freight rates are 40 per cent above costs on routes with little non-conference competition. However, the conferences usually provide a higher level of service. The Business Council of Australia (1988) reported that on balance, a 15 per cent cost saving was a reasonable estimate of the impact of curbing uncompetitive practices.

The BTE (1987) estimated that freight rate reductions of 20 per cent for non-bulk cargoes and 50 per cent for bulk cargoes were possible on the trans-Tasman route. They identified trade union policy and practice of excluding all but Australian and New Zealand vessels as a major source of inefficiency. Industrial restrictions imposed by both nations were seen by AMIC to have adversely affected trade between Australia and New Zealand (sub. 229, p.43). Without such bans, certain portions of the trans-Tasman task could be carried out by foreign vessels serving the Europe-Australasian and US-Australasian routes that often sail empty or partly laden across the Tasman. There is no legislative basis for the bans, but there has been no overt government support for their removal.

While improvements in the efficiency of international shipping would benefit Australia's exports of mining and mineral based products, it could concurrently reduce the landed price of imported processed products.

16.3 Rail transport

Most Australian mine outputs are consigned by rail to either ports (to be exported or shipped around the coast for further processing) or direct to processing plants. Both public and private rail services are used. While private rail services used to transport minerals are generally considered to be efficient, there is varying scope for improvement in services provided by public rail authorities. More importantly, rail freight rates charged by public rail authorities for many bulk commodities exceed the cost of providing services.

Freebairn and Trace (1988) estimated that for 1985-86 rail freight costs represented approximately 15 per cent of the seaboard price of Australian coal and iron-ore, 12 per cent of the seaboard cost of silver-lead-zinc ores, 6-7 per cent of the seaboard price of nickel, and 2 per cent of the seaboard price of tin and copper. In the period 1982-83 to 1988-89, the ratio of average rail charges to average export coal prices increased from 17 per cent to 24 per cent (Queensland Coal Association, sub. 70, p.15).

MIM Holdings Ltd (sub. 19, p.15) acknowledged 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."

MIM further stated (sub. 19, p.15) that:

The one encouraging feature ... is the performance by New South Wales, where rail freight was deregulated in 1988 and has significantly improved its competitive position.

There is, however, an urgent need for other state rail systems to be similarly exposed to commercial reality.

The mineral industry in particular and exporters in general should not be priced out of their export markets through unsupportable transport costs.

Barrack Speciality Metals also commented (sub. 75, pp.10-11) on the lack of competition for rail services and 'excess' freight charges:

State Government prohibitions on road haulage of ores and concentrates where rail services are available and their high charges for rail freight adversely affect cash flow and project viability.

Rail charges for mineral freight should more closely reflect the cost of services, and should not include excessive profit to boost State revenue (ie pseudo-tax).

Reduced rail tariffs could also be achieved through improving the efficiency of railway systems which operate as monopolies without incentives to improve services or restrain costs since there is no competition, and alternative modes of transport are often disallowed where rail services are available.

Lengthy negotiations with Westrail were required by Barrack to achieve a satisfactory contract for the transport of quartzite from the Moora Mine to Brunswick Junction for the company Silicon smelter at Kemerton. Road transport rates were very competitive, although the increased volume of heavy truck traffic would have introduced environmental concerns in some residential communities.

Western Mining Corporation Holdings Ltd said (sub. 69, p.40) that:

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 which they will charge. Productivity appears to be poor.

Different policies apply between the States with respect to the requirement to make, and the level of, any capital contribution made by the company to government railways in order to be supplied with rail freight services. Contributions are made in Western Australia and Queensland, the former based on actual equipment acquired, the latter based upon Queensland Railway estimates of capital requirements and incorporated into freight rates.

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.

Excessive costs

Private railways are owned and operated by companies for dedicated use and do not duplicate the existing public rail service infrastructure. The longest private rail line is from Mt Newman to Port Hedland - a distance of 423 kilometres - used specifically for the transport of iron-ore. Since the costs incurred in operating private lines are an integral part of the mine's total production outlay, there is an incentive for rail costs to be minimised. Labour conditions and technology constraints may contribute to higher costs than may be possible, but otherwise the costs of private rail operations can be considered an efficient cost benchmark.

Compared with private rail operations, most public rail freight services are inefficient. Comparisons of costs for public and private rail operations suggest that public rail operating costs for bulk minerals (excluding capital expenditure) are about 30 per cent higher than would be expected under private provision (IAC 1988a p.144).

An alternative approach to assessing the efficiency of public rail operations (necessary because of the lack of direct competition between public and private rail facilities), is to examine factors such as the degree of capital utilisation, the extent of overmanning and poor work practices, and the quality of output. The IAC (1989) estimated that existing 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 percent). This is equivalent to annual cost savings of approximately \$600 million. These estimated improvements related primarily to passenger and non-minerals freight services but the study also identified worthwhile savings for mineral freight.

Booz-Allen and Hamilton (1989) in its detailed review of the State Rail Authority of NSW (SRA), stated that although the SRA is seen as an efficient export coal transporter by any railway standard, the equipment and facilities were generally outdated, poorly designed and worn out. Further, the rail system was considered to be grossly over-staffed and inefficient with poor productivity due to outmoded work practices, excessive overheads and obsolete plant.

In recent years, the extensive capital development of rail services for the transport of black coal in Queensland and NSW has greatly improved the efficiency of these operations (see Box 16.2). Further improvements in efficiency could result from better utilisation of wagons.

Box 16.2: Efficient rail loading facilities

The Mount Thorley Coal Loader is a common user receival, stockpiling and rapid train loading facility near Singleton in the upper Hunter Valley. Most trains loading at the facility deliver coal to the Port Waratah Coal Services and the Kooragang Coal Loader at Newcastle.

The Mount Thorley Coal Loader services five mines representing about 30 per cent of the total tonnage of coal exported through the Port of Newcastle. Originally, the loader serviced only two mines and coal was transported by road through the main street of Singleton to a rail siding at Branxton, from which it was then transported by rail to Newcastle. Subsequently, a single spur railway from Wittingham on the main northern line to Mount Thorley was constructed to serve the developing coal fields.

The Gunnedah Coal Loader is not yet complete, but will be used to transport coal from the Gunnedah Coal Co. Ltd Gunnedah mine and Novacoal's Vickery mine to the port of Newcastle

Source: JCB (sub. 18, p.41)

Inefficient public rail freight services exist largely because there is little incentive to contain costs in an environment where (potential) competition is constrained.

In Queensland, the transport of minerals by rail is required by the Transport Act 1960. Applications for permission to haul minerals by other transport modes are treated on a case by case basis. Besides paying for public rail services, Queensland coal companies were required to fund the necessary capital for expansion and upgrading of the railway system and rolling stock between 1965 and 1988. (See also section 15).

The Department of Resources Development WA noted (sub. 48, E6) that:

The transport of a wide range of goods is open to free competition between road and rail. However, the transport of 'bulk' commodities (including ores and minerals) within the southern half of the state are - as a general rule - regulated to the rail system at present.

Dominion Mining Ltd stated (sub. 9, p.4) that when Westrail was approached with a view to transporting approximately 120 000 tonnes of Yakabindie nickel concentrate by rail from Leonora to Esperance, an exceptionally high freight tariff was quoted and Dominion was expected to supply its own locomotives and rolling stock. A road parallels the railway and it is far cheaper to truck the nickel concentrate by road even though it is ideal freight for rail transport.

Similarly, Oakbridge (sub. 32, p.11) stated that the company pays SRA rail freight at \$6.97 per tonne for transport from one of its mines, plus the wayleave to SMR of \$0.87 per tonne for use of that section of private line. That is, the current total freight is \$7.84 per tonne, not including an approximate cost of \$300 000 for its 9 kilometres of private railway for which it does not receive a rebate. This compares with a current road freight rate of \$6.02. In the rail freight agreement with the SRA, the Company is required to acknowledge that all coal produced must be offered to the SRA for rail transport.

However, the NSW Government claimed that the transport environment had in recent years been deregulated, and that rail was no longer guaranteed access to particular traffics and businesses and was in competition with road. Specifically, with respect to coal, the NSW Government said (sub. 52, p.57) that:

Coal rail freight rates have actually fallen over 20 per cent in real terms in the last decade. There were no price increases in 1986, 1987 or 1988, and there was an actual decrease in 1988. As a result, between 1986 and 1989 rates fell in real terms by 30 per cent and in nominal dollar rates fell over the same period by more than 10 per cent.

The NSW Government further submitted (sub. 52, p.57) that:

Although the market in which State Rail is now operating is deregulated, there are still mines for which road haulage is not a viable option due to restrictions on use of trucking in built up areas, or physical limitations imposed by coal loader design. In these instances, State Rail is sensitive to the prevailing circumstances, and refrains from monopoly pricing practice.

Excess charges

In addition to concerns about inefficiency in public rail services, it has also been claimed that freight charges exceed the cost of providing services. This is particularly alarming when the costs of provision are already inflated through inefficiency (see above).

EXXON Coal and Minerals summarised (sub. 58, p.11) the issue as follows:

There is ample evidence from consultant's studies and comparisons with the costs charged for coal and other bulk rail haulage elsewhere in the world to conclude that rail freight rates for coal haulage in NSW and Queensland include a high proportion of excess profits (i.e. profits over and above the level of return needed to raise the capital employed).

EXXON supports the widespread view that the State Rail Authority (SRA) in NSW and the Queensland Railway Authority (QRA) in Queensland are exploiting their monopoly positions to 'gouge' excessive rates from coal producers. Even though the industry is operating in a radically different world market environment with real coal prices less than half those of 1980-82 when rail rates were increased by the NSW and Queensland governments as a form of hidden taxation, the railways are able to continue to overcharge because the current producers have sunk their capital costs. Current producers have no alternative but to continue to operate whilst they are covering their cash costs but they are making an inadequate return on the capital originally invested ... we do not believe the SRA should make a 'profit' over and above its costs including depreciation and necessary return

on capital. We believe the role of such monopoly government instrumentalities should be to provide infrastructure services at 'cost including necessary return' so as not to discriminate between sectors of the economy ... the corollary appears to be that the export coal industry (or any industry) should not be required, through its freight charges, to cross-subsidise charges for other traffic ... we believe it is in the national interest for the railways' costs and charging policies for coal to be transparent and to be subject to detailed examination by independent experts.

State Governments in NSW and Queensland have used their monopoly ownership of the railways and ports, together with their legal power over the allocation of coal mining licences, to charge the export coal industry freight rates and port charges far in excess of supply costs (see Box 16.3). In effect, these excess charges are a tax and represent a significant source of state government general revenue. Further, since the magnitude of the excess charge varies widely from mine to mine, there are further intra-coal industry inefficiency effects.

Box 16.3 Estimates of excess rail charges

A number of studies and submissions to this inquiry have estimated the extent of excess charges for black coal operations in Queensland and NSW.

For example, Easton (1988) using 1985-86 data estimated that the average excess charge was \$5 per tonne in NSW and \$7 per tonne in Queensland. This translated into excess freight costs of some \$77 million in NSW and \$292 million in Queensland. Freebairn and Trace (1988), reworking Easton's data, estimated average excess rates of between \$5.20 and \$5.60 per tonne in NSW. The IAC (1988a) calculated average excess charges in 1985 of \$2.10 per tonne in NSW, and \$6.50 per tonne in Queensland.

The Australian Railways Union contested the high level of these estimates (IAC, 1989, p.19) and estimated that the excess coal freight charges amounted to a maximum of \$1 per tonne for NSW and \$4 per tonne in Queensland.

Acknowledging that freight rates and costs had changed since the mid 1980s, Easton's figures were updated in December 1989, (CRA, sub. 73, p.79) concluding that in 1989 the excess charge was \$2.44 per tonne in New South Wales and \$7.49 per tonne for Queensland.

The Queensland Coal Association estimates (sub. 70, p.14) that total excess rail charges in Queensland for coal in 1988-89 were at least \$450m.

At the company level, CRA Pty Ltd (sub. 73, p.80) estimated that its freight bill (in Queensland) in 1985 was about four times the actual cost of providing the service, adding approximately \$47 million to its operating expenditure.

Some concern has also been expressed that up-front charges paid by developers for rail related infrastructure exceeds the actual cost - that is, excess capital charges (IAC 1988a).

Coal rail freight rates in NSW are determined by negotiation between the developer and the rail authority while in Queensland they are negotiated between the developer and the Treasury. For some companies, these charges represent over 20 per cent of the fob price of coal.

The rail freight agreements typically include a freight rate escalation formula. This provides for an automatic escalation of freight rates according to movements in various price indices (for example labour, fuel and steel). The SRA does give the option of including the export prices of coal in the escalation formula, which some customers have taken up. However, there is no commensurate allowance for productivity improvements. Hence, the freight rate and the extent of the excess charge will likely increase with time. Further, the excess charge does not distinguish between deposits with high or low mineral rent and thereby impacts unevenly on the coal industry.

In recent years, discretionary power and negotiation have been executed to limit automatic increases in freight rates, although in Queensland there is provision for a 'claw-back' mechanism to recoup previous freight concessions (see Box 16.4).

Box 16.4: Queensland Railway's 'claw-back' arrangement

Claw-back was first introduced by the Queensland Government in 1985 to recoup previous rail freight concessions to mines developed after 1978.

The 'claw-back' provision were revised in 1987 and further refined in 1989.

The current mechanism is intended to trigger rail freight increases when the mines have regained the level of capacity to pay which existed in 1986. This is estimated by indexing the price of coal sold to the Japanese in 1986 by 50 per cent of the Consumer Price Index: when the actual export price exceeds this indexed price, 25 per cent of the difference is added to the rail freight rate.

The industry argues (eg ARCO Coal sub. 64, p.11) that the 50 per cent indexation factor is much too low to measure the industry's capacity to pay, thereby triggering 'clawback' too soon.

The Queensland Coal Association (sub. 70, p.18) said that, "... claw-back will be triggered long before the post-1978 sector returns to anything like its early 1986 position. In fact, it will be triggered even if the sector's current poor financial situation does not improve at all. This failure of the rail charges to adjust efficiently to prospective cost increases impacts to some degree on all the export mines. However, because of the claw-back, the effect is particularly pronounced in the post-1978 sector where it is capable of having quite serious consequences. For existing mines already subject to the system, it implies premature decline in production levels and hence premature closure."

In 1989, the Queensland Government revised its coal rail freight rate policy for new mines and major expansions of existing mines. The revised policy contains provisions which are substantially different from earlier agreements, in particular with government funding of all rolling stock and major railway upgrading works except for the rail spur line from the mine site to the main trunk system. The base freight rate is to be essentially cost based and generally provide no initial return to the State.

However, the coal industry is wary of the freight rate escalation provisions that would be imposed on a new mine. This is reflected in the Queensland Government's comment (sub. 55, p.18) that:

Notwithstanding the concessions in 1989, the industry continues to express concern to the Queensland Government about the present coal rail freight regime. The present government is committed to a review of rail freight charges.

Excess rail freight charges may not be solely due to the monopoly power of public rail authorities. They may be interpreted as a substitute for higher royalties in response to the high world prices of minerals of the early 1980s.

In a submission to the Commonwealth Grants Commission Relativities Review of 1981, the Queensland Government acknowledged that excess freight rates were (in part) a substitute for mining royalties. A similar determination was delivered by the Grants Commission in a subsequent 1988 review. This determination revealed that the direct revenue raising effort from black coal royalties were much lower in Queensland than in other states.

The ability to set excess charges is only possible because for the public monopoly of rail freight. The IAC (1988a) estimated that for distances up to about 140 km haulage of coal by road tends to be less expensive than rail haulage (although this did not take account of any 'external' costs of heavy vehicle activity in populated areas).

The existence of excess coal freight rates in NSW during the 1980s has been acknowledged by the state government. While there is no admittance that excess charges were a substitute for explicit royalties, it can be observed that variations in freight rates were linked to movements in coal prices.

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 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 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 in Section 14).

Recent reforms and initiatives

State rail authorities have spent substantial amounts on mineral freight operations in recent years; for example, Queensland Railways has electrified its coal lines (and some passenger lines) at a cost of approximately \$1 billion and the SRA has spent about the same amount over the last 10 years to upgrade its rail facilities for more efficient coal transport. While this has undoubtedly increased the technical efficiency of haulage the issue is whether the expenditure is economically efficient. Of direct interest is that NSW has not found it sufficiently worthwhile to electrify the SRA coal lines.

As for the future, the SRA has announced a package designed to increase the amount of coal shipped by rail. Included in the package are provisions for 2 per cent reductions in real freight rates, the introduction of volume incentive rates, and moves to eliminate cross-subsidisation in coal freight rates (Graham 1990).

In Queensland, future prospects of more efficient rail arrangements is indicated by the recent agreement negotiated between Pancontinental Mining and the Queensland Government to link rail freight charges for concentrate shipped from the company's Thalanga base-metals mine to the price of zinc. A similar deal is being negotiated for the Lady Loretta base-metals mine north-west of Mount Isa. These negotiations include a condition whereby the state Government will supply \$14 million of transport infrastructure (mainly rolling stock and sidings) for Pancontinental. This \$14 million will be recouped through add-on charges over several years through the rail freight package.

As part of a restructuring of the rail industry, the Railway Industry Council (which comprised representatives of rail management, rail unions, the Australian Council of Trade Unions and relevant governments) was formed with the objective to develop medium and long term strategies to improve the viability and competitiveness of the rail industry. A draft 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 rail 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 final report is due to be forwarded to the Government by 20 August 1991 (Treasurer 1990).

Conclusion

Inefficiencies in public rail services are adversely affecting the competitiveness of various mining and minerals processing activities. These inefficiencies can be divided into problems with pricing practices - excess charges - and features which generally inflate the costs of provision (such as restrictive labour practices, outdated rollingstock, poor wagon utilisation and costly maintenance).

Although on-line rail transport of coal is relatively efficient, a major problem remains with excess freight charges and off-line rail authority inefficiencies such as administration, repairs and maintenance. For other bulk minerals there is more scope for improved technical efficiency and for more efficient pricing structures.

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 minerals processing industry 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 the 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 chose.

16.4 Road transport of minerals

Road transport of minerals is small compared to the use of the shipping and rail transport modes. But, this does not preclude asking the question 'does road transport impede the competitiveness of the mining and minerals processing industries?' There are three aspects to this assessment:

- the freight rates charged for road haulage;
- regulations affecting the usage of road transport; and
- the quality of the road network.

The road haulage industry is highly competitive and this ensures that freight rates are kept to a 'minimum'. However, it is not efficient as the prices charged do not reflect the resource cost.

In particular, there is evidence that the various charges associated with road use do not cover the cost of road damage by heavy vehicles. The IAC (1989) reported that the cost recovery ratio of road damage for heavy vehicles (with more than six axles) ranges from 13 to 46 per cent,⁵ depending upon assumptions about what payments constitute road user charges. Concurrently, small vehicles paid more than their attributable road damage costs - that is, there is cross subsidisation of heavy vehicles from other vehicles.

Further, if prices are to reflect costs then other costs such as congestion and pollution should be included. These externalities can be quite intensive. For example, the Consumers Transport Council (sub. 44, pp.4-5) estimate that the full cost of heavy vehicle activity is about 6 cents per ntkm (net tonne kilometres) consisting of about 3 cents per ntkm for road damage and 3 cents per ntkm for external costs. As an example of the concern about these external costs CTC submitted (sub. 177, p.7) that:

Preconditions for coal transport deregulation should include full cost recovery from road freight operations, every measure being taken to improve heavy vehicle safety, and improvements to rail infrastructure (including completion of Maldon Dombarton). Even then, a case can be made on social and environmental grounds for having some restrictions on road haulage of minerals and coal in certain cases involving haulage through urban areas.

⁵ For the 46 per cent estimate, road use charges include all fuel excises, all petroleum franchise, licence fees, registration fees, stamp duties, sales taxes and customs duties.

Increased cost recovery from heavy vehicles would likely lead to some increases in freight rates for mining activities. In contrast, there are indications that the mining industry would benefit from changes in certain regulations on road transport usage. For example, BHP said (sub. 67 Chapter 3 p.13) that:

Land transport issues of particular concern relate to non-standard transport regulations between the states and the Northern Territory. For the Cadjebut operations, for example, the Western Australian government regulations restricts the maximum size of the road trains, which are used to haul ore concentrate from the mine to the Port of Wyndham, to 15 tonnes less than that permitted in the Northern Territory. Studies commissioned by the transport contractor from the Australian Road Research Board do not support the Western Australian government position. This discrimination affects competitiveness and for the Cadjebut mine imposes additional costs, compared, for example, to mining operations in the Northern Territory.

Perhaps the regulation with the most impact is the restriction on road competition with rail services. For example, CRA Limited when discussing (sub. 73, p.95) the introduction of competition to railways said that:

Competition against rail systems can also be stimulated by encouraging competing means of transportation. In Victoria alone the introduction of 'B-double' trucks has been estimated to have the potential to save \$100 million in freight costs per year. While B-Double trucks [are] legal in some areas of NSW, there are problems in bringing them into major port cities, limiting their capacity to compete with rail. The coal industry centred on Port Kembla suffers considerably from this as B-Doubles are more economic to operate and maintain their role. This along with poor quality roads and restrictive curfews, prevents any real competition with railways.

The merits of road-rail competition hinge on the balancing of the cost to society from undercharging by road haulage services and gains in efficiency in rail services from increased competition.

Finally, the road transport infrastructure can be considered separately from the haulage services. The NSW Government (sub. 52, p.59) believed that Australia's overstretched road system was restricting industrial productivity, including that of the mining and minerals processing industries. (eg BHP (sub. 67, Chapter 3, p.13) stated that poor road conditions contributes to additional maintenance costs and lower utilization of the trucks). The NSW Government submitted (sub.52, p.59) that:

There is a strong argument for a substantial increase in the level of Commonwealth road funding. The Inter-State Commission has found that the road freight industry is the second most heavily taxed in Australia (after oil), but that little of this Commonwealth Government revenue was returned to the roads.

Thus, potential efficiency gains exist in the mining and minerals processing industry, and Australia as a whole, due to improvements in Australia's road and road transport network. For example, the Inter-State Commission (1990) concluded:

- roads and road transport are important areas for microeconomic reform and the existing mechanisms for achieving these reforms have not succeeded in producing the necessary changes fast enough;
- greater efficiency and public accountability is required from our road authorities;
- there is an urgent need for a more national approach to road transport;
- existing road user charging arrangements are neither efficient nor equitable;
- there are large differences between individual state road user charges encouraging operators to 'shop around', penalising those states attempting to develop responsible road user charges;
- there are many opportunities for increased productivity through more innovative use of our road system.

Conclusion

Reform of roads and road transport will improve the competitiveness of Australian industry. Some of the changes will benefit mining and minerals processing such as improved roads and changes in regulations. Other changes such as increased freight charges to better reflect costs of road haulage will add to industry costs - although rail charges may concurrently be reduced through competitive pressure. Hence 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.

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16A RECENT REFORMS IN COASTAL SHIPPING

Before and after the release of the IAC's Coastal Shipping report in 1988, there has been a number of other government inquiries which have pointed to the need to reform shipping and waterfront activities. These are briefly reviewed below.

The Inter-State Commission (ISC)

The ISC was directed in 1986 to examine all aspects of the waterfront and develop an integrated plan to improve the industry's performance. The subsequent report (ISC 1989) released in April 1989 proposed reform to the waterfront including: the introduction of enterprise-based employment; changes to workforce size and industrial relations; and changes to the operation of container depots, bulk terminals, port authorities, land transport access arrangements and ship services.

A study prepared for the ISC's waterfront investigation found that a 35 per cent cost saving was achievable in Australia's waterfront activities. Most of this saving would be achieved through improved work practices, which would raise the productivity of both capital equipment (such as cranes) and the waterside workforce. A number of submissions to the ISC identified the segmentation of tasks between ship and customer, and the resulting fragmentation of responsibility as being a contributing factor to poor quality of service and on-going inefficient practices.

Waterfront Industry Reform Authority (WIRA)

On 1 July 1989 the Government in response to the ISC's waterfront report established the Waterfront Industry Reform Authority (WIRA), its task being to hold negotiations between waterfront unions and employers, with the aim of reaching an 'in-principle' agreement on the extent and pace of change within a three month period.

In September 1989, an 'in-principle' agreement between the Government, the Australian Council of Trade Unions (ACTU), the stevedoring employers, the Waterside Workers Federation (WWF) and eight other waterfront unions was agreed to. This agreement among other things, made provision for the introduction of enterprise-based employment contracts, the retirement of 3000 employees and the employment of 1000 new workers, over a three year period.

The Waterfront Industry Reform Authority process is not due for completion until June 1992.

Towage Industry Review Committee

The Towage Industry Review Committee was developed as part of the Government's strategy for reform of the maritime industry at the suggestion of the Inter-State Commission. Under the reform plan the towage industry workforce is to be reduced by 360 people over three years with a resulting cost saving for individual tugs of up to 30 per cent. The Minister for Transport and Communications (1989) said "because crew-related expenditure is the dominant cost item in tug operation ... [these reforms] will result in savings to the economy of about \$20 million."

Port operations

There have been recent developments at the State and Commonwealth level which have encouraged progress toward a more commercial approach by port authorities. The impetus for such reform came partly from the *Webber Report* (Industry Task Force 1986). There have also been several recent reviews of port operations by state governments. For example, the Victorian government completed major reviews of each of its statutory port authorities during 1986-87 aiming at improving the statutory guidelines covering their operation. A number of changes to operational arrangements has subsequently been implemented. In New South Wales, changes were recommended to the Maritime Services Board's operations in the *Joy Report* (1988). The NSW Government announced changes to the Board's management, organisational structure and pricing policies in April 1989. Work on port related issues has also been carried out by industry-based bodies working under the umbrella of the Inter State Commission.

The NSW Government stated (sub. 52, p.63) that the Maritime Services Board is currently undergoing reform, the framework for which is provided in the *Marine Administration Act 1989*. The aim of such organisational change is to increase local decision making, introduce progressive pricing reform along user-pays/cost-recovery lines, encourage private sector involvement in the development and ownership of port facilities, make clear identification of commercial, non-commercial and regulatory functions, place greater emphasis on strategic and corporate planning, and to improve the efficiency of ports and their responsiveness to user needs.

Similarly the Queensland Government noted (sub. 55, p.20) that: "Pursuant to a recommendation of the recent Waterfront Investigation of the Inter-State Commission, the Queensland Government is conducting a review of the pricing policies of Port Authorities and the Harbours Corporation ... The Government has also foreshadowed an inquiry into the structures of port authorities."

Prices Surveillance Authority (PSA)

In an attempt to ensure that improved efficiencies resulting from crew reductions and other reforms are passed onto the users of waterfront services, the Government has directed the Prices Surveillance Authority (PSA) to monitor coastal shipping freight rates.

Changes to voyage permits

The Minister for Transport and Communications (1990) announced changes to voyage permit guide-lines that enable foreign ships to operate with greater flexibility. The guide-lines included the reintroduction of continuing voyage permits and an easing of conditions attached to single voyage permits. Single voyage permits will no longer require that road or rail alternatives be considered if there are no Australian ships available. The decision to reintroduce continuing voyage permits (last issued twenty years ago) may be regarded as a modification of the cabotage policy which has discriminated against foreign ships in Australian coastal trade. In a press release the

Minister for Transport and Communications stated:

These initiatives will provide increased flexibility for Australian businesses needing to move cargo around the coast ... they will improve the efficiency of the coastal shipping market and create new opportunities for cost effective Australian flag shipping ... would enable shippers to better cope with short term surges in demand by supplementing the coastal fleet ... such permits could also be used to improve the overall efficiency of shipping by promoting a greater integration of coastal and international trading.

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Minister for Transport and Communications 1990, *Media Release*, 19 February.

17 LABOUR

Labour relations in the mining and mineral processing industries have been characterised by often bitter confrontation. Coal mining in particular has the worst record in terms of working days lost through industrial disputes of any industry in Australia. While a certain amount of conflict is inevitable, the extent of conflict is not. Shared goals and a generally co-operative approach are more likely to produce outcomes which are mutually advantageous to employers and employees alike. In particular, a less adversarial approach to labour relations is likely to deliver significant and ongoing gains in labour productivity, employment and pay. This will be essential if Australia is to maintain and develop world-class mining and minerals processing industries. However, the pace of change in labour market reform has been slow in the industries under reference. Managers will have to alter many of their own practices if they are to achieve the changes necessary for greater competitiveness, and will have to be more resolute in pressing forward for changes in employment relations which are of benefit to their own enterprises and the people who work in them. There are many areas where reform is urgently needed. Many mine operations are characterised by inefficiencies and inflexibilities because of restrictions enshrined in awards and in local "custom and practice". Award restructuring and proposals for union rationalisation and a single bargaining unit in each enterprise are positive beginnings to a better approach.

17.1 Introduction

Although 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), they employ only just over 2 per cent of the workforce. However, this does not mean that labour issues are unimportant. On the contrary, it means that industrial disputes in this sector can cripple the important contribution that it makes to the economy's well being. And it also means that more productive labour arrangements can dramatically improve this contribution.

Since 1985, employment in the mining sector has remained relatively stable, while the basic metal products sector has experienced a decline of almost 11 000 in the 1985 to 1987 period followed by an increase of almost 4000 by 1989 (see Table 17.1).

Table 17.1: Employment: All Employed Persons
(’000)

		<i>Manufacturing</i>	
	<i>Mining</i>	<i>Basic metal products</i>	<i>All industries</i>
1985	99.6	83.8	6 702.8
1986	102.0	79.0	6 948.4
1987	101.9	72.9	7 100.1
1988	96.0	78.8	7 361.1
1989	99.3	76.8	7 771.5

Note: Calendar year data compiled as the average of data for February, May, August and November.

Source: ABS, The Labour Force, Australia, Cat. No. 6203.0

The structure of this Section is to firstly outline general developments in industrial relations that are occurring in Australia which have implications for labour arrangements in the mining sector (eg award restructuring). This is followed by discussions of various industrial relations issues in the mining sector (such as restrictive work practices, health and safety).

17.2 General developments in industrial relations

Much attention has focussed recently on prospects for labour market reform. Some argue that a great deal of desirable change is being achieved as part of the ‘award restructuring’ process. Others contend that this process is not moving fully or fast enough. For example, CRA (sub. 73, p.57) argued that “... the major issue in the area of labour market reform is not so much the direction of change but the pace with which it is currently proceeding.”

The term ‘award restructuring’ refers to recent initiatives aimed at reforming our system of awards which regulate the wages and conditions of employment of approximately 85 per cent of Australian workers.¹ The aim is to address some of the structural impediments within the labour market, and includes but is not restricted to:

- establishing skill-related career paths as an incentive for workers to improve their skills;
- eliminating impediments to multiskilling and broadening of the range of tasks which workers may be required to perform; and
- ensuring that working patterns and arrangements enhance flexibility and efficiency.

For productivity improvements to be realised within individual enterprises, these award changes must be implemented in the workplace.

¹ Awards are legal instruments governing wages and conditions of employment which are determined by the Australian Industrial Relations Commission or corresponding State or other industrial tribunals. These determinations record Commission (or other tribunal) - approved outcomes of negotiations between management and labour or of Commission (or other tribunal) arbitration if a negotiated settlement cannot be reached.

As a means of complementing the award restructuring process, the union movement - with the assistance of the Commonwealth Government - is attempting to rationalise the number and coverage of individual unions. A recent amendment to the Industrial Relations Act has increased the minimum union membership requirement from 1000 to 10 000 and will help streamline the amalgamation process. The Australian Industrial Relations Commission also has power under the Industrial Relations Act (s. 118) to alter the representation of workers in particular workplaces to reduce the number of unions involved.

Rationalisation of union coverage is also being driven by a set of principles recently formulated by the Australian Council of Trade Unions (ACTU). The objective is to end up with fewer (and larger) unions with an ultimate objective of a single employee bargaining unit in each enterprise.

New ACTU principles underpinning union rationalisation categorise unions into three groups:

- 'principal unions' will have the main responsibility for conducting negotiations and will have the right to recruit any employee within the industry;
- 'significant unions' will continue to be able to recruit members consistent with their current constitutions and will have to agree to negotiate in a single bargaining unit with the principal union; and
- 'other unions' will be permitted to remain in the industry if their members insist but will not be able to recruit new members and may not prevent their members leaving to join the relevant principal unions. They must also work within the single bargaining unit and actively service their members.²

The upshot of the application of these principles is that 'other unions' are likely to wither away quickly, 'significant unions' are likely to wither away slowly, and 'principal unions' will become dominant (and large) 'industry unions'.

Some unions within the coal industry have recently combined, bringing the idea of a single industry union closer to realisation. The Miners' Federation and the Mining Mechanics Association were amalgamated on 9 February 1990 to form the United Mineworkers' Federation (UFMA). The new organisation has over 14 000 members. Prior to this amalgamation, the Miners' Federation absorbed two small State unions - the Collie Miners' Union and the Sydney Coal Lumpers' Union.

The UFMA will become the designated 'principal union' within the industry with other unions in the industry (Amalgamated Metal Workers Union, Electrical Trades Union and Australian Collieries Staff Association) competing for 'significant union' status. The Federated Engine Drivers' and Firemen's Association has longer term plans - together with the Building Workers Industrial Union - to amalgamate with the UFMA.

² See Huntley (1990), pp. 3-5 and Williams (1990), p.14.

The likely outcome in the other industries under reference is not as clear at this stage as in the coal industry. But the intent is to bring about a significant rationalisation of union coverage in the various industries to meet the objective of the Commonwealth Government and the ACTU of "a single employee bargaining unit in each enterprise."

Rationalisations will undoubtedly be of benefit to the competitiveness of the mining and minerals processing industries, provided due regard is paid to the representational preferences of union members in each enterprise. Such employee choice was recognised in Professor Niland's proposals regarding enterprise-focused bargaining units in his report to the NSW Government on the State's industrial relations system. Niland (1989, p.150) recommended a procedure for the formation and recognition of enterprise-focused bargaining units, including the establishment of enterprise-based trade unions. He proposed secret ballots in order to identify the union which would represent employees in negotiations for enterprise-wide collective agreements.

The interests of mining employees and employers

Notions of how industrial relations ought to operate are influenced by perceptions of the extent of mutual dependence between employers and employees. In recent years, the union movement in Australia has moderated its claims for improvements in its members' wages and employment conditions as part of its Accord with the Commonwealth Government. This moderation has been in recognition of the adverse impact of excessive claims on the available number of jobs in the economy. Award restructuring, for example, stresses the potential mutual benefits that can be obtained by a more co-operative approach between employers and employees.

Both the Australian Mining Industry Council (AMIC, sub. 29,) and its associate, the Australian Mines and Metals Association (AMMA, sub. 134), emphasised to the Commission the mutual long-term interests of employers and employees. AMIC (sub. 29, p.66) further added:

Often these mutually dependent interests are forgotten, ignored or rejected by one of those groups either directly or indirectly via external parties to the direct operation of the enterprise and results in the breakdown of that critical key relationship.

While grievances and conflict are always likely to exist to some degree under any sort of arrangement, arrangements which provide for constructive resolutions and which address the underlying causes, recognising the large degree of common interests and mutual dependency of employees and their employer, are likely to produce large benefits for both groups. With an enterprise focus, mutual advantages will be more apparent because each employer and their own employees are in a better position than outsiders to understand their own and the enterprise's potentials and needs, and have a stronger incentive to produce effective, mutually-satisfactory arrangements.

These arrangements, however, may be less than desirable as far as the community is concerned if they are developed against a background of lack of competition in the product markets. This last proviso does not apply to the Australian mining and minerals processing industries. Hence, there is a presumption that the community will be best served by industrial relations arrangements in

mining and minerals processing which have a strong focus on what is suitable for each particular enterprise and workplace. Such focus will enable more appropriate industrial relations arrangements to develop in terms of flexibility of employment, durations of attachment between employees and their firms, training, and incentives for acquiring skill, and improving performance. Both AMIC and AMMA emphasised the importance of such incentives within an enterprise focus:

- "The rewards received by employees and general wage policies must take account of performance and skill levels" (sub. 29, p.67)
- "The introduction of performance related reward systems to individually reward effort will be possible in enterprise-based negotiations." (sub. 134, p.9)

Production bonuses are an important element of performance incentive and flexibility in the mining industry (UMFA, sub. 23, p.88).

The ability of enterprises to adapt to changing market demands, and the speed with which they are able to adapt, are key factors affecting competitiveness. This point was made by AMMA:

If employers are to be able to cope quickly with changes in the domestic and international market they will have to build that ability into their systems through flexible work methods. (sub. 134, p.8)

Adoption of a less prescriptive approach as part of negotiations under award restructuring should help. Relying on third-party involvement is likely to slow the process of change and may impose additional costs on industry.

It is unrealistic and inappropriate to suggest that industrial conflict could be eliminated altogether, but the industries under reference in this inquiry, particularly the coal mining industry, would benefit enormously from greater recognition of mutual interests. At Hamersley Iron, for example productivity increased significantly following employer and union negotiations in 1987. The negotiations included changes to work practices (including reduced manning levels) and classifications (CRA, sub. 73, p.59). However, one can question whether changes of this magnitude would have occurred without a sense of urgency being created by market imperatives.

In another (more recent) case, Commissioner Gregor of the Western Australian Industrial Relations Commission, described an agreement at the Mt Newman Mining Company as "the most far reaching changes to working patterns and arrangements that the Commission as constituted has ever seen in the Pilbara including those which emanated from the Robe River events of 1986" (Gregor 1990, p.7). The Commissioner went on to describe the situation two years earlier where disruption and confrontation predominated (see Attachment 17B). His observations regarding current industrial relations at Mt Newman are worthy of repeating in full:

Since then there has been a change to how the operation is conducted, it has a management which appears to me to be sensitive to the need to build relationships in its organisation and it has done so carefully and slowly. In doing so the confidence that was lacking from the workforce has been largely restored. The different industrial relations philosophy that the management has put into place is manifest by the type of enterprise bargaining that has been adopted for these discussions. The bargaining is taking place between line management and shop floor representatives or workers with assistance, as necessary, from outside with help in

the form of advice and suggestions. The product is a result of genuine bargaining in the enterprise with minimum involvement from outside thereby assisting the education process, equipping the parties in the movement towards enterprise responsibility for industrial relations, which is at the centre point of the philosophy behind the current wages principles. (Gregor 1990, p.13-14)

This statement points to the sorts of fundamental changes in industrial relations that are necessary in the mining and mineral processing industries. If our industries are to be world competitive, industrial relations practices need to be better managed at the enterprise level. Trust and commitment need to be better shared between employers and employees, and greater recognition of mutual interests will need be an integral part of industrial relations.

BHP Steel (sub. 67, Chapter 7) provides another example where more co-operative relations at the local level between management and the workforce have led to increased productivity. Following the Steel Industry Plan (1984-1988), BHP Steel negotiated the Steel Industry Development Programme (SIDP)³ with the unions. Unlike the Plan, SIDP has no government involvement and is supplemented with local agreements. Specific work site commitment to SIDP was seen by the parties as crucial in the programme's success. The final agreements were signed by June 1989.

SIDP and the local agreements operate within the current industrial relations framework and provide for consultative arrangements, training, career development and award restructuring. However, these agreements are not just about industrial relations. Importantly, they set performance targets at every level of the Company's operations and on processes for identifying and implementing measures to achieve them. As a means of focussing on Company objectives, the agreements include a commitment to total quality control principles and to growth through export based initiatives.

In the past, BHP Steel (sub. 67, Chapter 7, p.8) had lost 2 per cent of production time from industrial disputes. Under the agreements the figure has dropped to around 0.2 per cent. Productivity for the year ending May 1990 was 350 tonnes per employee compared to around 170 tonnes per employee in 1983.⁴

Generally, participants expressed a view that greater changes to existing institutional arrangements were desirable. CRA for example, stated:

The current institutional arrangements (particularly award and union structures) have restricted the capacity of business, unions and tribunals to bring about changes in work practices at a pace sufficient to cope with the demands of the international market place.(sub. 73, p.62)

The AMMA (sub. 134, p.19), while arguing in favour of enterprise based bargaining, also supported the retention of statutory conciliation and arbitration machinery as a means of assisting employer and employees resolve any differences.

³ For discussion of SIDP, see Economic Planning Advisory Council (1990), pp.8-9.

⁴ SIDP was recently praised at a joint address by John Prescott, Chief Executive Office of BHP Steel, and Steven Harrison, National Secretary of the Federated Ironworkers' Association; see Prescott (1989) and Harrison (1989).

17.3 Significant industrial relations issues in the mining sector

Industrial Disputes

Despite the significant reduction in the number of working days lost through industrial disputes in the mining industry - especially coal mining - industrial disputation remains very high. The industrial dispute figures for twelve months ending August 1990 show that the number of working days lost per thousand employees in coal mining was 32 times the all industries figure, and in other mining, was almost 5 times that figure (See Table 17.2).

Table 17.2: Industrial disputes
(Working days lost per thousand employees)

	<i>Mining^a</i>		<i>Manufacturing</i>	
	<i>Coal</i>	<i>Other</i>	<i>Basic metal products</i>	<i>All Industries</i>
1985	6 892	1 928	568	228
1986	10 741	3 328	816	242
1987	8 920	1 072	1 347	223
1988	15 548	1 777	3 265	269
1989	5 505	642	439	190
Twelve months ended-June 1990	4 917	610	na	184

a Includes Petroleum Exploration

Source: ABS, Industrial Disputes Australia, Cat. No. 6321.0 & 6322.0; and unpublished information supplied by ABS.

Many employer submissions complained of the disproportionately high number of working days lost through industrial disputation in the mining industry compared to others. The UMFA attributed (sub. 23, pp.88-89) the high level of industrial disputes in the coal industry to two 'special factors':

- first, the dangerous and unnatural conditions of mining work, the historically antagonistic industrial relations in the industry, and the culture of the industry; and
- secondly, the democratic decision making process within coal industry unions, which requires the holding of 'aggregate' 24 hour rank and file meetings. These meetings are counted by ABS and the Joint Coal Board (JCB) as lost time due to industrial disputes.

Our industrial disputes record with overseas producers is also not particularly good and there is scope for a great deal of improvement. Table 17.3 shows international comparisons in the mining and quarrying sector for Australia and selected overseas countries. In 1987, the number of working

days lost per thousand employees in mining and quarrying in Australia was 3.5 times higher than the UK, 5.1 times higher than Canada and 17.6 times higher than Japan.⁵

It should be noted that industrial disputes are not only relevant as a direct cost but also affect our reputation as reliable supplier of minerals.

Table 17.3: Industrial disputes: international comparisons, mining and quarrying
(Working days lost per thousand employees)

	<i>Australia</i>	<i>Canada</i> ^b	<i>Japan</i>	<i>UK</i> ^a	<i>USA</i>
1980	na	na	101.7	481.2	1 696.4
1981	7 209.7	3 056.4	369.3	248.5	7 375.4
1982	na	1 607.1	242.6	na	136.3
1983	3 156.1	1 143.5	171.1	na	139.1
1984	3 312.6	182.9	14.1	68 758.4	467.6
1985	3 450.3	440.3	59.9	na	537.4
1986	5 765.7	1 809.4	419.1	588.5	na
1987	3 631.1	713.5	206.0	1 043.3	na
1988	6 062.9	na	23.4	na	na
1989	na	449.5	na	na	845.9

Note: Calendar year data calculated by dividing ILO data on 'working days lost' by 'employees in economically active population' in mining and quarrying.

a Data for the UK was calculated by dividing ILO data on 'working days lost' by 'total economically active population' in mining and quarrying.

b Industrial dispute data for years 1980 to 1985 exclude stoppages involving less than 10 work-days not worked. Beginning 1986 figures include stoppages involving 500 workers or more.

Source: ILO (1980-88), Year Book of Labour Statistics

The Commission believes industrial disputes within the mining industry are far too high. Such high levels of disputation are evidence of very flawed arrangements governing work relations (in coal mining in particular). This situation is not one that should be tolerated.

Work practices

Responsibility for restrictive work practices in the mining industry can be ascribed to all parties to the industrial relations system. At the Commission's hearings, Mr Ellis, Deputy Executive General Manager of BHP Utah Minerals International, was direct in attributing industrial relations responsibility to management:

The general proposition in senior management in BHP is that bad industrial relations are a function of management almost exclusively, and where you look to fix your industrial relations problems is management.(Transcript, p.1366)

⁵ Caution should be applied in making international comparisons in industrial disputes data as there are, in some cases, differences in definitions of what constitutes a dispute.

Management has too readily made incremental work practice concessions to meet short-run pressures which have accumulated into major inefficiencies and "rotts" in the longer term. Unions have sought and defended such concessions in work practices with a misplaced zeal. Tribunals have too often failed to make rational decisions in the light of clear evidence of pointlessly - wasteful work practices.

Speaking about Robe River Iron, for example, the Trades and Labour Council of WA said:

- "The company [Robe River] would not have been viable, although it was still making quite healthy profit the way it was being run; but we believe the changes were inevitable." (Meecham, Transcript, p.200)
- "We are not denying the productivity gains that have been made [at Robe River] but they do not need the managerial style that now exists at Robe to achieve those. They are achieved elsewhere without it." (Transcript, p.198)

While some participants indicated that work practice inefficiencies were of major concern, very few proffered details. Oakbridge Ltd provided the following list of areas of local restrictive practices operating at their mine:

- overaward payments (ie water and dirt classifications)
- differing sick leave agreements encompassing drawn out absentee agreements
- seniority (shift and job)
- manning on draglines, shovels, longwalls and/or continuous miner units, etc
- transportation of men and materials around the mine
- cumbersome job demarcation constraints (sub. 32, p.43)

Kembla Coal and Coke pointed to restrictions which prevented them from making the best use of their workforce. For example, for every two mine workers a tradesman must be employed to maintain their equipment. Restrictions such as this were considered to be "less a legal requirement than an industrial imperative".(Transcript, p.1805)

Other restrictive practices in the coal mining industry include the changing of shifts at many underground mines that have to occur above the ground, thus increasing the number of unproductive hours. It was reported that employers' ability to hire workers was restricted to a union list. (EXXON, sub. 58, p.8) Coal mining unions maintain a practice of holding 'aggregate' meetings that require 24 hour cessation of work. The rationale for this is to enable workers, irrespective of rostered shift, to attend the meetings (see UMFA, sub. 23, p.89). This practice contributes to unnecessary working days being lost. Other forms of communication are possible, such as short on-site meetings.

Award restructuring offers an appropriate framework for those practices offering little advantage at high cost to be seriously reviewed. The agenda for award restructuring in the mining and minerals processing industries should not be narrowed to exclude the giving up (or modifications) of many

practices of little genuine benefit, and the "cashing out" of others where significant benefits to employees exist which are less than the costs to the enterprise. In other words, there should be a fair sharing of the productivity gains resulting from removing restrictive practices.

Enterprise flexibility

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.⁶

AMIC, for instance, argued in its submission that the development of positive management and employee relations was fundamentally dependent on developing enterprise level agreements:

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. (sub. 29, p.66)

CRA has adopted this approach and has devolved day to day responsibility for employee relations to operating units and line managers.

Business units have been encouraged to reduce their reliance on third parties, be they tribunals, Federal or State union officials, corporate headquarters or employer associations. The level of industrial and personnel administration resources at headquarters has been substantially reduced and business units look to headquarters not for instructions but for advice and assistance as required. (sub. 73, p.58)

CRA also indicated that current moves to introduce more enterprise bargaining and to change underlying institutional arrangements may lead to more positive results than past efforts at decentralisation:

This is not to say that, on the basis of past experience, concerns should not exist about the economic and industrial implications of greater decentralisation in industrial relations. Our institutional arrangements, the structure of unions and employer associations and the structure of awards have generated severe wage inflation when in the past attempts have been made to give greater freedom to individual employers and unions to bargain collectively. It is equally true, however, that no previous attempt has been made to tackle the underlying institutional features of our industrial relations system which predispose it to periodic wage breakout, nor has institutional reform of this nature been an integral part of plans to provide greater scope for enterprise level bargaining. (sub. 73, p.57)

Notwithstanding the general view that more flexibility is required, there appears to be scope under the current industrial relations system for more flexibility to come about.

⁶ For example, AMMA, p.9.

For example, there is provision under Section 115 of the Industrial Relations Act for certified agreements to be negotiated which may not necessarily conform to the Wage Fixing Principles. Although this new provision has been used in only a limited number of cases, the potential for wider application exists. Another means of entering into enterprise agreements which has increased in recent years is through specific enterprise awards or appendices to existing multi-employer awards (see Attachment 17A).⁷

Most private sector awards are minimum rates awards. There is nothing to prevent employers from paying more than the minimum rates stipulated in such awards. Indeed, within the mining industry production bonuses (which are negotiated locally without tribunal involvement) are common.

Upward wage flexibility under these arrangements has not been without its problems, as CRA has pointed out:

First, particularly in periods of high economic activity, the over award area has been a fertile ground for union campaigns and industrial disputation which has challenged the authority of industrial tribunals. Second, pressures for flow on of gains in this area to other firms, industries and awards have arisen and have frequently led to severe wage and price inflation. (sub. 73, p.56)

Award prescriptions on employment conditions can be a more important impediment to flexibility than wage prescriptions are: for example, matters such as operating times. Until 1988, the coal mining industry's production was limited to approximately 235 days a year. Furthermore, in the absence of agreement, ordinary shifts were confined to seven hours per day for productive operations (Oakbridge, sub. 32, p.43). In September of that year, the Coal Industry Tribunal (CIT) handed down a decision that made significant award changes to working time arrangements in return for wage increases. The actual benefits to the industry of that decision, while said to be significant in terms of providing much more flexibility, were considered by Oakbridge to be too costly (sub. 32, p.44).⁸

Western Mining Corporation complained at the Commission's hearings of the requirement to give long periods of notice before they were able to shed labour. The three or four months notice required was observed to contrast starkly with other industries and to add to costs.(Transcript, p.536)

Trade union structures

Our traditional craft and occupation based union structure is considered by many not to be suitable. Pressure for change is coming from two sources. The union movement is aware of its declining membership base and is making efforts to hasten amalgamations. It is motivated by a need to concentrate its resources and to provide a better service to members.

The other push to change union coverage is coming from some employer groups, including the Business Council of Australia (BCA 1989) and the Confederation of Australian Industry (CAI 1990, pp.2-9). Employer representatives consider that the craft and occupational nature of unions

⁷ See M. Rimmer (1989).

⁸ Refer to Smith (1990), pp.19-31.

do not make them receptive to needs of the enterprise. A similar position has been succinctly expressed by a former Secretary of the Vehicle Builders Employees' Federation, the Hon J. S. Thompson:

... if a union has a stake in an industry or a firm in its entirety, the success of that industry or firm is important to that union.(BCA 1989, p.88)

BCA's emphasis is on better employee and employer relations at the enterprise level with little or no third party intervention.

While the union movement's approach is towards fewer, bigger and more resourceful unions, the BCA approach does not see the problem as being too many unions. Rather it is the multiplicity of bargaining units within each enterprise that it sees as the problem. BCA's ultimate goal is to have one union per workplace, with a workplace focus. Furthermore,

Whether that one union were an enterprise union or a reasonably autonomous branch of a larger union is not something that, it is believed, is necessary or sensible to prescribe in advance.(BCA 1989, p.84)

The BCA and others have argued that ACTU proposals for union amalgamations (before the recent "principal", "significant" and "other" designations were proposed) would not decrease in any significant way the number of unions per enterprise (BCA 1989, & Blandy et al 1989, pp.373-374).

As noted earlier, the ACTU now appears to share the view that a single bargaining unit per enterprise is an appropriate objective of trade union rationalisation.

Various submissions to the Industry Commission expressed a need for more rationalised union structures. CRA, for instance, pointed out that in its experience in the coal industry in 1989, union rationalisation "can remove major impediments to the negotiation of significant gains in operational flexibility, training and skills acquisition and use".(sub. 73, p.60) In its submission, CRA went on to say:

Without this rationalisation [between Mine Mechanics and the Miners' Federation] of union coverage in parts of the industry, it is doubtful whether the gains in work practices and operating efficiencies would have gone as far and have been achieved without industrial disputation. However, the same achievements have not been gained in Queensland where reform is still some way off. (sub. 73, p.60)

BHP Steel indicated the multiplicity of unions, and their organisation along occupational or craft lines, was where most comment and criticism was directed. It favoured "a reduction in the number of unions but not if the reduction results simply in fewer and bigger occupational and craft based unions each with coverage of a broader spectrum of industries."(sub. 67, Chapter 7, p.9)

The idea that unions should be organised along industry or enterprise lines was supported among others by AMMA. (sub. 134, p.18). Both AMMA (sub. 134, p.18) and AMIC (sub. 29, p.67) submitted that industry and enterprise based unions would be more appropriate for the development of mutual trust, co-operation and commitment to common goals and the improvement of enterprise performance. AMMA also added:

... with enterprise based unions, the continued viability of the union is directly linked to the continued viability of the enterprise. (sub. 134, p.18)

Union submissions to the inquiry were more reticent about the appropriate union structure for the industry. However, the Australian Collieries Staff Association (ACSA) (sub. 34, p.17) while pointing to the logic behind the UMFA trying to cover all tradespersons, argued that for supervisory staff to be covered by the UMFA would lead to "unfortunate consequences" .

Unions with an enterprise focus and a decision-making process that is decentralised are likely to be more receptive to the needs of the organisation and its employees. This is happening in West Germany and Sweden - "The parallel large unions should be seeking is with such countries as West Germany or Sweden, where large unions have devolved successfully a good deal of functional autonomy to the local or enterprise level." (BCA 1989, p.89). An establishment operating under this type of arrangement will be more flexible and adaptive, and will be able to serve the needs of its customers better. The earlier quote from the Hon J S Thompson still seems to ring true. An enterprise focus will help employees and employers to concentrate on their shared objectives.

In addition, many restrictions are currently placed on managers, particularly by industrial relations tribunals, because of the flow-on consequences of many decisions regarding wages and employment conditions. With an enterprise focus, this transmission mechanism should be greatly curtailed.

Blandy and Brummitt (1990, pp.59-62) point to three reasons why a union structure which is workplace-focussed will have productivity benefits. First, it gives greater scope for common employer/employee interests to be attained. Employees would be more likely to identify with the particular circumstances of their workplace. Secondly, a workplace-focussed union structure will highlight the connection between enterprise productivity, on the one hand, and wages, employment conditions and employment, on the other. Thirdly, the 'voice effects' of unions (ie, union scope for expressing employee grievances and for improving management/employee communications) are likely to be more productivity-enhancing than under a craft union arrangement.

Labour earnings, costs and productivity

Employers expressed concern at the high level of labour costs in mining relative to other industries. AMIC, for instance, argued that:

Labour costs must be linked to productivity; increased wages must be fully offset by guaranteed productivity improvements accruing to labour factors. (sub. 29, p.66)

In contrast, unions suggested that earnings are not excessive. The Australian Collieries Staff Association argued that the high labour costs in coal mining are caused by management's preference for overtime rather than a larger pool of employed persons (sub. 34, p.8). This section investigates these competing claims.

The actual level of wages, considered in isolation, says little about the efficient operation of the labour market. It is the relationship between wages and productivity that is the paramount issue. In order to achieve the most efficient allocation of labour, economic theory suggests that an employee's earnings should be directly related to his/her marginal productivity. High levels of wages may not adversely affect industrial competitiveness if productivity is also similarly high. Rewarding productivity improvements with higher wages provides an incentive for labour to move to the most productive sectors of the economy and aids the process of specialisation in more efficient industries.

Employees in the mining industry are the most highly paid of any major industrial grouping. In May 1989, the average weekly total earnings for full-time non-managerial male employees was 147 per cent of the all industries average (see Table 17.4). This large wage premium is not a new phenomenon. The base rate for mining employees has been the highest of all industries for many years.

While there have been reasonably large wage rises in mining in recent years, the average wage growth rate in mining, between 1980 and 1989, was only slightly above the all industries average. The average increase in average weekly total male non-managerial earnings for mining workers was 8.72 per cent compared with the all industries average of 8.34 per cent (see Table 17.4).

Average weekly total earnings in the basic metal products sector were approximately 114 per cent of the all industries average for full-time adult non-managerial male employees in May 1989. Since 1980, total earnings in basic metal industries has increased faster, but not significantly faster, than the all industries average at a rate of 8.93 per cent of annual average growth (see Table 17.4).

Table 17.4: Average weekly total adult male earnings (non-managerial)
(Historical values \$)

<i>May</i>	<i>All industries</i>	<i>Mining</i>	<i>Basic metal</i>
1980	264	376	287
1981	297	447	320
1983	358	497	388
1985	413	603	453
1986	439	659	481
1987	465	717	528
1988	500	717	566
1989	543	798	620
Av. annual growth rates (%)			
1983-1989	7.19	8.21	8.13
1980-89	8.34	8.72	8.93

Note: Unfortunately, ABS data for 1982 and 1984 was not available. The average annual growth rates were calculated as geometric averages where the rate r is measured by the formula $r = (S_{88}/S_{80})^{1/8} - 1$, where S_n is the \$ quantum of the variable in period n for which a growth rate is estimated. The average growth rates will vary if the base year for the index is changed. ABS 5211.0 adopts a base year of 1984-85. The base for determination of annual growth rates is May 1980. May data for 1989 are currently available only in preliminary form. The additional average growth rate of 1983-88 was presented for compatibility with productivity estimates.

Source: ABS, Distribution and Composition of Employee Earnings and Hours, Australia, Cat. No. 6306.0

The submission of the Department of Industrial Relations provides measures of labour productivity based on output per person employed (sub. 145 p.35). As indicated in this submission, annual productivity data for the mining industry are particularly volatile, due to the sensitivity of capital and labour utilisation to the business cycle and to oil exploration activity. As noted by ABS (Cat. No. 5211.0 - which is the basis of the productivity analysis), there are significant deficiencies in the estimation process. Of particular importance, is the variability in employment data which includes part-time and casual employment.

The average annual growth rate of labour productivity in mining over the period of 1982-83 to 1988-89 was 6.36 per cent - significantly in excess of the average for the market sector of 2.36 per cent. Over the last two years productivity grew strongly in the mining industry - increasing by 8.4 per cent in 1987-88 and 10 per cent in 1988-89 (see Table 17.5). (These figures are significantly smaller, but still high in relative terms, if output per hour worked is substituted for output per employee).

The average annual growth of labour productivity in the basic metal products industry was 7.41 per cent, also in excess of the average for the market sector, for the period of 1982-83-1988-89. It is worth highlighting the particularly strong productivity growth of 14.6 per cent that occurred in this sector 1988-89 (see Table 17.5).

Table 17.5: Labour productivity growth

	<i>Annual per cent change from previous period</i>		
	<i>Market sector</i>	<i>Mining</i>	<i>Basic metal</i>
1982-83	-3.0	7.6	0.1
1983-84	5.8	11.4	19.2
1984-85	4.2	5.6	9.8
1985-86	0.8	12.8	3.2
1986-87	-1.0	0.4	2.8
1987-88	3.0	8.4	-3.5
1988-89	1.5	10.0	14.6
Av. annual growth rate % 1982-83 to 1988-89	2.36	6.36	7.41

Source: Department of Industrial Relations (Sub. No. 145) and ABS, Australian National Accounts, Gross Product, Employment and Hours Worked, Cat. No. 5211.0

Table 17.6: Earnings and productivity

	<i>The ratio of cumulative earnings to cumulative labour productivity</i>		
	<i>1979-80 to 1988-89</i>	<i>1982-83 to 1988-89</i>	<i>1984-85 to 1988-89</i>
All Industries	2.04	1.39	1.28
Mining	1.69	1.11	1.06
Basic Metal	1.37	1.04	1.16

Source: ABS, Distribution and Composition of Employee Earnings and Hours, Australia, Cat. No. 6306.0 and ABS, Australian National Accounts: Gross Product Employment and Hours Worked, Cat. No. 5211.0

Note: May earnings figures have been applied to productivity figures for the financial year in which the survey was conducted, ie. May 1985 related to the financial year 1984-85. The earnings index adopted May 1985 as the base and the productivity index adopted 1984-85 as its base year.

Table 17.6 compares average earnings to average productivity growth for the period 1979-80 - 1988-89. In the measured periods, aggregate wage rises exceeded aggregate productivity growth by a significant margin. This margin, has however, decreased in more recent years. In mining and basic metal industries relatively high rates of labour productivity have meant that the wage productivity gap is much smaller than in other industries. A high ratio of earnings to productivity in mining in the period 1979-80 - 1988-89 may have been caused by large increases in oil exploration in the early 1980s. Since this time, the differential between wage and productivity growth has steadily narrowed and in the 1984-85 - 1988-89 period the adverse effect on competitiveness from wages exceeding productivity growth was relatively small. In the case of basic metal industries in the period of 1982-83 - 1988-89, cumulative wage growth was only 4 per cent higher than cumulative productivity growth. This margin increased as labour productivity growth became depressed in 1985-1988.

While the cumulative effect of wage growth in mining and minerals processing industries was sufficiently high to place upward pressure on the industry's costs, this does necessarily mean that Australia is not competitive as regard labour cost in mining and basic metal industries in comparison to our trading partners. Although Australian workers in mining are relatively well remunerated by international standards, labour productivity is also relatively high. Consequently, the claim that the high level of Australia's wages in mining undermines our competitiveness has not been verified statistically.

Coal industry

Employers' submissions that commented on the coal industry's institutional arrangements proposed that the CIT be integrated with the Australian Industrial Relations Commission. These submissions also favoured the disbanding of the JCB. The UMFA, on the other hand, argued strongly for the retention of the current institutions contending that the coal industry is a special case.

The CIT, continues to operate despite the recommendations of the Committee of Review into Industrial Relations Law and Systems (1985, pp.437-8) and the Niland Report (1989, p.85) to have it abolished. The Commission is not convinced by the unions' arguments in favour of retaining the CIT (this is covered in more detail in Section 22). Similarly, the Commission questions whether the role of the JCB could be carried out more efficiently by other established bodies. A less interventionist government role would, in the Commission's view, also help improve management and workforce communications. In the medium to longer term, the high level of conflict within this industry will only be reduced if employers and employees are encouraged to resolve industrial disputes locally without third party intervention.

The industry has recently undergone and is still undergoing, a great deal of change. As mentioned earlier, award restrictions on working hours in the coal industry have been eased considerably as a result of the September 1988 decision of the CIT. The award changes included:

- increases in the duration of standard shifts from 7 to 8 hours with provision for extension by agreement while maintaining an average of 35 ordinary time hours per week;
- the removal of the 3 to 4 week Christmas shut down, thus allowing production for 52 weeks per year;
- allowing non-production work and underground development operations 7 days per week, and underground production 6 days per week; and
- allowing make-up production lost through weather conditions, breakdowns and industrial disputes generally on the 6th day in the week.

The benefits for the industry from this decision, however, are not clear. Many participants indicated that the gains from more flexible operations were outweighed by higher wages for the additional time spent at work.

Changes are proceeding under award restructuring with a new interim award endorsed by the CIT in April 1990. The Federal Department of Industrial Relations (DIR, sub. 145, p.15) submitted that since the September 1988 decision, "productivity in the coal industry has increased, disputation has decreased, and there has been a marked attitudinal change in relations between the principal parties in the industry". The industry, however, still has a long way to go in improving its industrial relations record.

Section 22 of this Volume discusses in more detail the coal industry including the institutional arrangements.

Occupational health and safety

The standard of occupational health and safety in the mining industry is relatively poor. According to the DIR the industry has the highest rates of deaths, injuries and workers' compensation costs of any industry in Australia. (sub. 145, p.ii)

A study of work-related fatalities in 1982-84 showed that mining and quarry workers are almost nine times more likely to be killed at work than the average Australian worker, and that the injury incidence rate is more than five times the all industries average.⁹ DIR submitted that the cost of workers' compensation for fatalities and injuries per employee in the industry is more than two and half times the Australian workforce average (sub. 145, p.23). Furthermore, DIR indicated that there appears to be no sign of this performance improving (sub. 145, p.23).

Unlike other industries, mining has industry-specific State-based legislation administered by Mines Departments or equivalent authorities. State and Territory occupational health and safety legislation has been enacted to reflect the Robens approach¹⁰ based on workplace consultation and employer self-regulation. The same philosophy has not been adopted by the mining industry where mines inspectors are required to enforce a highly prescriptive set of regulations. The industry is faced with inconsistent standards between States/Territories with implications for industry efficiency and health and safety outcomes.

The NSW Coal Association was particularly critical of the NSW Coal Mines Regulation Act which is currently under review by the NSW Government. According to the Association, 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 felt that the very prescriptive regulations accompanying the Act focussed attention away from health and safety and made compliance an end in itself (p.12). While "substantial regulation of coal mines is appropriate" according to Oakbridge (sub. 32, p.27), the NSW Act and its regulations were unnecessarily prescriptive and imposed a particular management structure. The NSW Coal Association also indicated that

Notification, approval and appeal procedures are unwieldy, detailed and far too lengthy. (sub.45, p.13)

⁹ See DIR (sub. 145, p.23) for summary of Worksafe Australia's study (published in February 1989).

¹⁰ From the 1972 UK report by the Robens Committee.

The Association (sub. 45, p.12), together with DIR (sub. 145, p.29), argued that the responsibility and personal liability for mine safety should rest with the employer, as in other industries, rather than with the mine manager as is presently the case. In DIR's view, the present situation:

... places mine managers in the invidious position of attempting to reconcile the economic performance requirements of their employers with the duty-of-care needs of their employees, but without the ultimate financial discretion in operational decision-making. (sub. 145, p.28)

Under general occupational health and safety legislation, the employer bears the responsibility.

However, the UMFA is uncomfortable with many of the NSW Coal Association's proposals for change to the Coal Mines Regulation Act. The UMFA submitted:

The unions are opposed to watering down legislation and regulations which will endanger the lives and safety of coal mineworkers, including the dilution of clear lines of responsibility in coal mines spelt out by the Coal Mines Regulation Act. (sub. 129, p.4)

DIR argued that, given the consistently poor record of the mining industry, both the framework and attitudes need to be reviewed and improved. In its view "active and responsible involvement of employers, management, employees and trade unions is essential to achieve a good occupational health and safety performance".(sub. 145, p.28)

A system that provides a greater degree of self-regulation is likely to deliver a safer working environment providing employer/employee relations are based on good communication, trust and decentralised decision-making. This approach is consistent with the workplace focus favoured by the Industry Commission. There is a role for inspectors and penalties under such a system. However, the emphasis should be on prevention through better occupational health and safety training and more responsible attitudes on the part of all concerned. Adoption of relevant State and Territory occupational, health and safety legislation by the mining industry - as argued, among others, by the Trades and Labour Council of WA (sub. 39, p.39) - may be appropriate.

17.4 Conclusions

Australia's economic imperatives require more immediate and more substantial changes to our labour markets. There are many aspects of work in the mining and mineral processing industry that need to be improved - pay structures, skill formation, incentives for performance, turnover, work practices and demarcation, for example.

While changes to institutional arrangements will go some way in removing impediments to greater efficiency, gains will also come from improvements in workplace relations between employers and employees. Intangible matters such as communication, trust and commitment often underpin particular forms of work practices, job satisfaction and productive performance.

Better relations between employers and employees are likely to result where conflict resolution and negotiations are more decentralised and enterprise focussed, and where third party intervention is minimised. Settlement of industrial disputes should be encouraged between the parties themselves.

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

The Commission is also of the view that the rationalisation of union representation with the objective of developing single bargaining units in each enterprise, offers significant potential gains in productivity, competitiveness and rewards in the mining and minerals processing industries.

On the evidence presented, the Commission believes that the JCB and the CIT should be disbanded and their functions transferred where appropriate to other relevant federal and State authorities. The coal industry should not be treated as a "special case" for regulatory purposes. Special institutional arrangements are not warranted.

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17A SINGLE UNION COVERAGE AT SOUTHERN ALUMINIUM

A successful example of an attempt to use a positive approach to employee relations as a central part of business strategy is Southern Aluminium's plant at Bell Bay in Tasmania. A 1989 industrial agreement between Southern Aluminium Pty Limited and the Federated Ironworkers' Association (FIA) was the first attempt within the federal industrial relations system to use the new Industrial Relations Act as a way of obtaining formal recognition of single union coverage at a worksite. The case was also unique in that the parties combined the coverage issue with the new certified agreements provision in the Act. While the agreement has now been accepted by the Australian Industrial Relations Commission (AIRC), it has been challenged in the High Court where (at the time of writing) it still awaits a hearing.

Background

Southern Aluminium is a joint venture company established to produce high quality aluminium wheels predominantly for the world export market. The venturers consist of CRA's subsidiary, Comalco (51 per cent), Enkei (15 per cent), Mitsubishi (15 per cent) and the Australian Industry Development Corporation (19 per cent). The Bell Bay plant was commissioned in mid 1989 with investment valued at around \$53.5 million. It will employ up to 155 people and has a capacity to produce 600 000 aluminium wheels a year.

As a 'greenfield' site, the company took the opportunity to create a single union site with a set of employment arrangements that would make it a world exporter of a high quality product. Southern Aluminium and the FIA asked the Australian Industrial Relations Commission (AIRC) to certify the agreement under section 115 (certified agreements)¹ of the Federal Industrial Relations Act, and argued that the site should be covered by a single union - ie, the FIA, - using the AIRC's demarcation resolution powers under section 118 (demarcation dispute)² of the Act. Normally, maintenance employees would have been covered by the Amalgamated Metal Workers Union (AMWU) and the Electrical Trades Union (ETU). Under the agreement, both production and maintenance employees were covered by the FIA.

¹ Section 115 was introduced by the Government to allow the greatest possible flexibility while avoiding the undesirable outcomes of a totally decentralised system - ie, by restricting the flow of increases from one area to another. The AIRC may therefore certify agreements which will override its awards for a fixed duration. Once certified, these agreements may not be changed, except in rare circumstances.

² Under section 118, the AIRC may deal with a demarcation or impending demarcation dispute. It can issue orders which give exclusive coverage to one of a number of competing federally registered unions, all of which normally have coverage of a class or group of employees.

A key objective for the company was to begin operating a new plant with no demarcation lines and with workers able to inter-change jobs. Before the AIRC, the company argued that the employee relations arrangements at the plant - including single union coverage of all employees - was an essential ingredient in making the enterprise efficient and competitive. It also argued that those arrangement were an essential feature of the whole package on the strength of which the joint venturers made the decision to go ahead with the plant.

The agreement, therefore, was seen by the company as central to its business strategy. Important features of the agreement included:

- *a commitment to quality, reliability and cost effectiveness* - a number of innovative work arrangements include a skill extension program, performance and skill related pay, 12 hour shifts, team briefings and other consultative arrangements;
- *continuity of production* - both parties are committed to ensuring continuity of production and supply while consultation arrangements address individual or collective grievances;
- *workplace flexibility* - there is a single work classification with seven skill levels eliminating demarcation between classifications. Day-to-day deployment of the workforce is determined by skill and operational needs;
- *a strong commitment to training and development* - there is a strong emphasis to on-the-job training with one day in each 28-day/night cycle devoted exclusively to training and problem solving activities;
- *skills extension program* - provides the basis for employees to progress through to higher skill levels where they receive increased rates of pay based on their demonstrated competency; and
- *removal of 'them and us'* - artificial distinction between employees have been removed with everyone employed on monthly hire, monthly pay and sharing common facilities at the workplace.

The Australian Industrial Relations Commission's Decision

On 15 December 1989, a Full Bench of the AIRC handed down a decision which gave the FIA full coverage of the production and maintenance workforce at the plant; and deprived the ANWU and the ETU the right to represent those employees.³ In the AIRCs view, demarcation disputes would otherwise be likely if FIA coverage were not granted.

With respect to the section 115 application, the AIRC set that matter aside to give the parties "an opportunity to review the terms of the agreement with the knowledge that the FIA now has the right to represent all employees at the plant (AIRC (1989) p.34).⁴ However, it went on to say "that

³ The Designated Presidential member would need to make the necessary alterations to the eligibility rules of the unions concerned. The matter went to the High Court before this process was completed.

⁴ The AIRC signalled that further consideration would need to be given to the operative date of and the duration of the agreement which was signed on 1 March 1989 for a 12 month period.

there is nothing in the substantive terms of the agreement in its current form which would, in our view, inhibit its certification" (AIRC (1989) p.34). In fact, the AIRC was supportive 'of various aspects of the agreement which, in its view, were of considerable benefit.

The High Court Challenge

Following an application by the AMWU, the High Court granted an order preventing the AIRC from further hearing the matter pending the outcome of a hearing before the Full Court of the High Court. The AMWUs argument is that the AIRC lacked jurisdiction to make the necessary orders in the case. The High Court is yet to hear the case.

In the meantime

The operations at Southern Aluminium, nevertheless, have not been hindered in any significant way by the above delays. In fact, the company has been very successful and is currently exporting all its output, with important overseas contracts such as BMW in Germany. Since the plant started in July 1989, it has manufactured over \$6 million worth of aluminium wheels.

17B CONFRONTATION AT ROBE RIVER

Within the context of industrial relations, the name Robe River conjures up many opposing and sometimes extremist, points of views. Within a six month period, the new management of Robe River was able to eliminate restrictive work practices that had been allowed to develop over many years and to more than double productivity. However, the bitterness of the dispute continues to linger and divide the local communities involved. This case study outlines the events as they unfolded and questions the approach taken by management.

By early 1986 Peko-Wallsend had gained a controlling interest of Robe River Iron Associates. Robe River had previously been managed by US-owned Cliffs Western Australia Mining with significant Australian and Japanese shareholdings. Since the project became operational in 1972, management had allowed numerous restrictive work practices to develop. In the ensuing dispute, 200 such practices were identified by management.

Cliffs had automatically collected union subscriptions on behalf of the unions and maintained a closed shop. It permitted union meetings during working hours without loss of pay. The company paid the five or six site conveners who were occupied on fulltime union business, as well as providing them with offices, telephones, car maintenance and fuel, and other benefits.

At the time, Robe River was also plagued by industrial disputes. According to the company, in the 19 months to July 1986, an average of 5293 hours per month were lost through strikes and work bans, or an average of 4.3 hours per wage employee per month (Gethin (1990) p.47). Not a single month went by without a strike.

The lock-out

In a widely reported confrontation, Peko-Wallsend had four of Robe River's senior managers replaced on 31 July 1986, and informed its employees and their unions that restrictive work practices would no longer be tolerated. The unions responded by making an application to the Industrial Relations Commission of Western Australia for an order to block the announced changes.

The Commission's initial response was to order Robe River to restore the pre-31 July status quo for 30 days, while conciliation conferences took place to try to resolve the dispute. The company dug its heels in and dismissed workers who disobeyed management instructions. Following a further hearing, the Commission issued another order on 11 August reinstating the sacked workers under their old terms of employment and without loss of entitlements. In response, Robe River management gave dismissal notices to all 1248 wage employees and decided to close down its operations at the start of that night's shift.

The lock-out ensued for three weeks. It ended on 3 September after Robe River's appeal - against the Commission's reinstatement order - to the Industrial Appeals Court was dismissed. Throughout this time, the company insisted that the matters should be arbitrated and refused to have anything to do with conciliation. The Western Australian Industrial Relations Commission (WAIRC), while critical of management's approach, conceded management's right to make sweeping changes to work practices (Thompson and Smith (1987) p 82). Of the 32 matters considered by the Commission, only six relatively minor ones were found in the unions' favour. Other work practices, while brought before the Commission, were never pursued by the unions.

The strike

Following the lock-out, an uneasy peace presided over Robe River until December 1986. The issue which ignited worker hostility concerned the number of workers to be used on power shovels. Custom throughout the Pilbara had two people to each shovel. The company now insisted that shovels be operated by one person. Members of the Federated Engine Drivers and Firemen's Association walked off the job on 10 December, followed by the rest of the workforce six days later.

Management then used staff labour to load and move iron ore to the port site. In response, the maritime unions, who had previously not been involved in the lock-out or this dispute, joined the strike.

By the beginning of the new year, Robe River had filed writs for damages against ten unions and eighteen individuals, including union officials and conveners.

An initial peace plan - which included the resumption of work and the withdrawal of all writs - put together by the then ACTU President, Simon Crean, and Peko-Wallsend's Managing Director at the time, Charles Copeman, was rejected by the rank-and-file. A slightly amended package was accepted at a mass meeting on 24 January 1987 and workers returned to work the following day.

The aftermath

A notable outcome arising from the confrontation was the considerable increase in output and a significantly reduced workforce. According to Robe River, in the 19 months' period to July 1986, production averaged 1.181 mt per months, or 951 tonnes per wage employee per month. From February 1987 to September 1989, the average number of wage employees dropped to 726 (from 1248 in July 1986) but average production increased to 1.614 mt per month, or 2224 tonnes per wage employee per month - an increase of 134 per cent. As a result of this productivity increase, Robe River was able to claim that its workforce were now the most highly paid in the Pilbara (Gethin (1990) p.47).

Robe River's saleable production decreased from around 15.6 million wet tonnes (mt) in 1984-85 to just over 11.8 mt in 1986-87. By 1987-88, saleable production had increased dramatically to just over 19.4 mt and has continued to increase to 22.8 mt for 1989-90 (see North Broken Hill Peko Limited (1988, 1989, 1990) Annual Reports).

However, the effect on local community was to split it into two - between staff and wage labour. One article illustrates the animosity that had developed:

A worker was sacked for jumping over a fence and punching the general manager at a party being held for Japanese visitors. Workers booked off on sick leave after a company newsletter threatened to 'get diehard unionists'. Workers drank at the public bar while staff stayed in the lounge; children fought at school over issues backed by parents; and a large number of workers (at least one-third of the labour force) resigned. (Thompson and Smith (1987), p.83)

Issues

Robe River's dramatic improvements in productivity should not be taken as a justification for the actions that management took. The important question - although not one that is easily answered - is whether the same results could have been achieved through negotiations with the unions and its workforce. While management took a hard line and pushed through with the changes, one should not lose from sight that the substantive changes were eventually processed through the WAIRC.

According to the Assistant Secretary of the Trades and Labor Council of Western Australia, Mr Meecham:

"The company would not have been viable, although it was still making quite healthy profit the way it was being run; but we believe the changes were inevitable." (transcript, p.200)

Even from within the union movement there was a feeling that work arrangements had to change, although one cannot be certain whether this attitude was a result of the events at Robe River or whether a similar attitude prevailed prior to the confrontation.

A recent agreement at Mt Newman stands in contrast to the changes made at Robe River in 1986. Commissioner Gregor of the WAIRC referred to the Mt Newman changes to working patterns and arrangements as being more far reaching than those resulting from the Robe River dispute.

Mr Meecham also pointed out to the Commission that significant changes have been achieved at CRA's Hamersley operations mostly through negotiations but without "the unnecessary feeling of intimidation, of fear, of unhappiness that exists in the Robe organisation" (transcript, p. 198). Regarding Robe River, he said:

We are not denying the productivity gains that have been made but they do not need the managerial style that now exists at Robe to achieve those. They are achieved elsewhere without it." (transcript, p.198)

The extent of change possible at Robe River at the time under a different management strategy is difficult to determine in hindsight, Particularly given the emotional reaction that the dispute often provokes in people who were personally involved. Nevertheless, it seems that the many of the entrenched restrictive work practices would have taken too long to remove or settle without a sudden shock.

In some cases, sudden shock treatment may be what is needed - and Robe River may have been one such case - but there are other costs involved which need to be taken into account in using such a strategy. In the short-term, there is the disruption to normal operating activities. There are also a range of matters that affect an enterprise's productivity in the long-run in terms of job satisfaction and involvement, attracting and retaining a skilled workforce, and workforce flexibility.

If there is a lesson to be learnt from this case study it is that management needs to be vigilant in ensuring that inefficient work practices are not allowed to flourish in the first place. Confrontation may be necessary in some cases but solving industrial relations problems through negotiation should be a necessary first step in any dispute resolution process. ..

18 ENERGY

Despite improvements in the performance of public electricity authorities in recent years there is considerable scope for further increases in the efficiency with which electricity is generated and distributed in Australia. Such improvements may be the difference between some minerals processing projects being viable or unviable. In the case of natural gas much less comment was received from participants but there would also appear to be scope for lower costs than under the present industry structure and pricing arrangements. This section examines these issues as they affect the efficiency and competitiveness of mining and minerals processing activities but does so briefly in view of the Commission's separate inquiry into Energy Generation and Distribution.

Electricity and gas represent on average a higher proportion of total production costs of mining and minerals processing than for many Australian industries. Electricity is far more important than natural gas at both the mining and processing stages and perhaps explains why participant' comments on electricity far exceeded those on gas.

18.1 Electricity

Participants' comments covered several issues. Many claimed that electricity provision in Australia was inefficient for various reasons and that this inflated costs.

MIM Holdings Ltd (sub.19, p.14) stated:

Electricity energy in metal processing facilities can account for up to 40 cent of total operating costs. Consequently access to low-cost power is essential to maintain competitiveness.

Although Australia has abundant reserves of low-cost 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 per kilowatt hour (cpkwh).

By concession, 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 effecting 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.

Barrack Specialty Mines (sub.73, p.3) said:

The availability of adequate supplies of electricity at internationally competitive tariffs is an important factor if energy intensive industries and downstream manufacturing industries are to be attracted to Australia.

State governments should ensure that electricity generating capacity is planned and installed sufficiently ahead of major project developments to offer encouragement to investors in further value added secondary processing projects. The need for sufficient uncommitted surplus capacity to shorter lead time required for fast track industrial projects compared with that for a base load power station.

The Cement Industry Federation noted (sub.46, p.7) that:

...energy is the most significant variable cost to the industry after transport and possibly raw materials. Typically power consumption in cement industry would approximate 11 per cent of the cost of production ... thus any measures taken by the Government and their Agencies to render the electricity supply industry more efficient and hence to reduce electricity tariffs will benefit the competitive position of the cement industry.

Inefficient electricity supply

In its separate inquiry into energy generation and distribution the Commission (IC 1991) concluded that the electricity supply industry in Australia was inefficient and that this inflated the costs of provision. Inefficiencies in production (and pricing) practices were largely attributed to the electricity authorities being insulated from competition. While recent reforms have led to some improvement in efficiency, the changes have largely been made within the existing environment of restricted competition. Larger and sustained improvements in efficiency are more likely if there is greater competition in the industry.

Electricity (and energy costs generally) can be reduced not only by more efficient supply but also by improved plant and process design. Queensland Alumina Limited (sub.31, p 5) said: "As a consequence of the 1960's basic design, energy use is high, particularly compared to new plants." Energetics (1990) considered that there were ample opportunities for energy savings in metal processing. Specific measures cited included: improved heat recovery through heat exchangers and regenerative burners; improved combustion control; and the use of ceramic fibre furnace linings.

Pricing of coal inputs

A further aspect of the efficiency of community resources devoted to electricity supply is the issue of whether coal inputs are appropriately priced. The impact on the economy's resource efficiency from inappropriately pricing those inputs may be substantial since coal used for electricity generation represents a large share of coal resources. For example, it has been estimated that coal usage for electricity generation over the next 50 years will deplete demonstrated reserves by 18 per cent and deplete demonstrated and inferred reserves by 3 per cent.

The Senate Committee on Natural Resources (1981) – the Development of the Bauxite, Alumina and Aluminum Industries – considered the issues of the appropriate price to charge for coal used in electricity generation. At the time, the Electricity Commission of New South Wales (ECNSW) and the State Electricity

In the case of black coal used by ECNSW, the price is much lower than the export price of steaming coal. Dick (1981) estimated that the difference in price amounted to an indirect subsidy to aluminium smelters in NSW of \$45 million 1980-81.

The Senate Standing Committee did not agree to the use of export parity pricing of black coal in all circumstances. In particular, it expressed concern that if export parity pricing results in electricity costs which preclude further processing of alumina there may be a net loss of the economy. In cases involving the integrated use of a number of resources, the Committee suggested that close examination should be made of the benefits and costs to resource efficiency of raw material pricing.

Determining the opportunity cost of the brown coal used by the SEVC is more difficult since it is non-tradeable. In the absence of a traded price for comparison, the alternative is to assess the present and future uses of brown coal. This is difficult because the Victorian Government has reserved large quantities of brown coal for future electricity generation thereby curtailing competition between alternative uses of brown coal. At present the opportunity cost of brown coal is probably only marginally above the extraction cost.

International comparison of electricity charges

Several participants compared Australian electricity prices with those available overseas as an indicator of the efficiency of the Australian electricity supply industry and to show the adverse effect on their international competitiveness.

The Northern Territory Government (sub.77, p.27) said:

Pricing policies for energy often lead to reduced competitiveness of domestic locations for raw material processing. Particularly energy intensive industries, like the aluminium industry, find it exceedingly difficult to establish new feasible operations/extensions in Australia. Australia's power costs are well above Venezuela's or Canada's where hydroelectric power generation costs are as low as 13 per cent of the US selling price for aluminium. At Portland, Victoria, the electricity price is restricted by a separate provision in the power tariff agreement to 19.5 per cent of the selling price. If Governments are serious about expanding further processing of raw materials, pricing of energy will need to be in line with international competitors or other specific comparative advantages for downstream projects have to be created.

Similarly, Barrick Specialty Mines (sub. 75, p.4) made the following observation:

Electricity prices offered for energy intensive industries in Australia are generally not internationally competitive and have restricted development. In recent years, Canada and Venezuela have aggressively and successfully promoted opportunities for industrial development based on the availability of abundant supplies of competitively priced electricity. Some of these mineral processing developments represent opportunities lost to Australia.

In its defence, the Electricity Supply Association of Australia (sub.72m p.2) said that:

... with the exception of Canada (with its large hydro resources) and South Africa (with its very weak currency), Australia electricity prices provide a very efficient contribution to the international competitiveness of the Australian mining industry. This efficiency has been further enhanced by the real price reductions in electricity tariffs that have generally occurred throughout the Australian electricity supply industry.

Table 18.1 shows indices of estimated electricity prices paid by aluminium smelters in a selection of countries. There were seven countries where electricity was available at a cheaper rate than in Australia.

Table 18.1: Index of estimated aluminium smelter electricity prices, 1990 (Australia = 100)

<i>County</i>	<i>Price Index</i>	<i>County</i>	<i>Price Index</i>
Egypt	48	South Africa	138
Venezuela	48	United Kingdom	139
Canada	52	Netherlands	144
Cameroon	63	France	146
Indonesia	87	Brazil	151
Norway	91	FDR	159
Middle East	96	Greece	159
Australia	100	Spain	164
Iceland	113	USA	184
Switzerland	117	Sweden	199
Argentina	120	India	230
Ghana	123	Italy	315

Source: CRA (sub. 73, p.140)

International comparisons, however, are not a valid basis for assessing the efficiency of the Australian electricity industry.' Beside methodology problems, such as exchange rate conversions at a point in time, it is not known whether the prices charged in other countries reflect the cost of supply. For example, The Basic Metals and Minerals Processing Industry Council (19\$9) said: "Large energy-intensive ventures, such as aluminium smelters, have always been able to do deals."

The efficiency of Australian resource use will be best served by ensuring that the domestic electricity industry is as efficient as possible and that the prices charged to users reflect closely the costs of provision. If other countries have a comparative advantage in electricity supply, Australia should not subsidise the use of electricity to match overseas charges/costs. Even if other nations subsidise their electricity users, Australia should not attempt to match the price: their subsidies are at a cost to other industries and tax-payers in those countries.

Differences between States in the provision and pricing of electricity

participants in the inquiry were concerned about differences in electricity tariffs between States and the implication that location within Australia was a determinant of the competitiveness of a project.

The New South Wales Chamber of Mines, Metals and Extractive Industries commented (sub. 37, p. 11) that:

Unfortunately the price of electricity to energy intensive industries in New South Wales is generally not as low as in either Victoria or Queensland. The only notable exceptions are the aluminium smelters in the Hunter Valley where, sensibly, special negotiated rates apply. However, for the bulk of large users in the State the high cost of electricity is a major deterrent to the development of the mining and minerals processing industry.

NSW has abundant supplies of steaming coal on which are located some of Australia's largest and most modern generating power plants with ample capacity, yet the price of electricity to large industrial users is still not generally competitive with either Victoria or Queensland.

These large users, who provide much of the investment and employment basis of the State's economy, have operations which are very much 'energy dependent.' Under the present pricing structure, based on the concept of a Bulk Supply Tariff (BST), these large users are seriously disadvantaged compared to similar industries in other States.

Industry considers that the present level of electricity charges in New South Wales to large users is due to a combination of several factors:

- (a) Significant cross subsidisation in favour of residential consumers at the expense of industrial consumers.
- (b) **The BST** is not cost reflective and does not differentiate sufficiently between consumers on the basis of actual costs which they impose on the system.
- (c) The development of generating capacity by ELCOM which is excess to demand, and the absence of pricing policies to stimulate demand.

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- (d) The electricity supply agencies' apparent commitment to 'cost plus' pricing policies, without stated targets for real cost reductions.
 - (e) The lack of flexibility for ELCOM and county councils to negotiate with large consumers due to the present BST representing an arbitrary 'floor price' generally well in excess of industrial rates available in Queensland and Victoria.

The Northern Territory Government commented (sub. 77, p.19) on the Territory's natural disadvantage:

Traditionally higher energy costs in the Northern Territory represent an impediment to mining and, in particular, to further downstream processing. Although the Power and Water Authority in the Northern Territory constantly tries to increase its consumer base, the relatively small population in remote areas and the length of transmission lines necessary represent a considerable obstacle to reduced power tariffs to the mining industry. The construction of necessary installations is also subject to delays because of land access problems. Such delays are costly and adversely affect the overall unit costs.

Pasminco, in discussing discrepancies in pricing between States, said (sub. 89, p.35) that:

Electricity represents a major cost item in both mining and smelting. Obviously therefore, Pasminco must be vigilant with regard to this input cost but at the same time the company recognises its lack of real power to negotiate electricity charges which are fair and reasonable.

Whilst the position in South Australia does not cause concern compared with the position of other lead smelters in the world, there are problems with power costs in both NSW and Tasmania.

Like comparisons across countries, comparisons across states require careful interpretation. Relative costs will vary between States depending upon the circumstances - size of state, population density, whether continuous supply is required - and the charging policies of electricity authorities. The Queensland Government explained (sub. 55, p.24) the wide range of electricity costs within the state for different mining and minerals processing activities and these will carry over to comparisons across states:

Major energy-intensive industries in Queensland (eg aluminium smelting) with electricity requirements of hundreds of megawatts of near continuous loads are supplied at prices which reflect the costs of supply at the highest voltage levels in the system. Such supply does not incur the costs of sub-transmission and distribution construction, operation and maintenance which are included in standard tariffs applying to smaller customers. Supply to such major industries is given under long-term 'take or pay' agreements which commit the user to pay for the contracted supply whether fully used or not and which provide for a guaranteed return on the funds invested to supply the load.

Smaller electrical loads with mining operations and mineral processing are supplied under the standard retail electricity tariffs but may require capital contributions as discussed below.

circumstances peculiar to mining developments dictate a special approach to the provision of supply. Mines are often located in remote areas and therefore require dedicated transmission and sub-transmission facilities which are of little use once the mine ceases operation. Standard tariffs may not cover investment costs and because of this, large mining loads are required to make a contribution towards the capital costs of those facilities so that their full cost will be met over the life of the mine.

in summary, the basis of electricity tariffs for supply to mining and mineral processing industries is the recovery of the cost of providing that supply. The particular set of circumstances of each project mean that this principle results in tariffs ranging from the costs of bulk supply for the largest projects to full retail plus contribution towards the cost of the supply for the smaller, more remote projects.

Differences in electricity prices across states and for different minerals is to be expected. The IC (1991) identified inefficient supply by all state electricity authorities. Even if that problem were rectified, differences across states and minerals would remain.

Inefficient pricing structures

For economic efficiency, prices should reflect the marginal costs of their (efficient) supply. Electricity supply costs are highly dependent upon the time of supply, the quantity required and the degree of reliability, and the costs of all energy forms are influenced by the distance they must be transported.

Historically however, electricity tariffs have taken little account of such variations in cost conditions except for some peak/off-peak distinctions. Variations in electricity prices are more common for different classes of customer (for example pensioners and, more importantly for this inquiry, between domestic and industrial users) than differences on the basis of underlying cost characteristics.

Oakbridge (sub. 32, p. 12) suggested that electricity tariffs for coal operations in NSW exceed the cost of supply:

Electricity is a significant component of underground coal mining costs amounting on average to about \$1.25 per tonne.

The coal mining industry, particularly underground mining, is the ideal electricity customer for the power generation and distribution authorities. Apart from being a large consumer of electrical energy, consumption occurs fairly evenly over a 24 hour period. Coal mines in NSW nevertheless are subject to a high voltage (33kV) industrial tariff that accords insufficient recognition to the system benefits of this demand pattern. The coal industry appears to be cross-subsidising other power consumers.

The power authorities should recognise the capital contributions made by coal producers for construction of electricity supply and infrastructure (such as distribution lines and substations) in setting charges. One further point is that penalty clauses apply in NSW for the power factor below these limits.

Alternatively, there has been wide debate about the possible subsidising of electricity used for aluminium smelting. The controversy has arisen out of the widespread concern that the community at large is subsidising the provision of electricity either directly, in that the price of electricity is less than the cost of supply, or indirectly in terms of income foregone because the various factors of electricity production, such as coal and capital, are not being valued at their opportunity cost. These concerns have been exacerbated by the confidentiality surrounding the terms and conditions of contracts between smelter companies and electricity authorities.

Reform of electricity pricing structures to better reflect the costs of supply will improve the efficiency of the electricity supply industry and will give more appropriate signals for efficient consumption and investment decisions by users.

Recent reforms and the way ahead

In recent years, some governments have initiated programs aimed at improving efficiency. Approaches adopted include restructuring of electricity tariffs, initiatives to increase labour productivity, introduction of corporate plans specifying objectives and performance targets and less Ministerial involvement. In discussing these reforms, participants made the following comments.

The Australian Mining Industry Council (sub. 29, p.11) said:

... energy generation and supply activities should be exposed to competitive market arrangements with governments withdrawing from these sectors of the industry. The distribution networks should continue as part of the national infrastructure along with the supply of equipment to the same point that currently exists in both domestic and industrial sectors of the market. Commercial electricity supply companies would then purchase access to the distribution network to enable them to service their customers. Government operated electricity generating capacity could compete with the private sector operators within the system.

Barrack Specialty Mines (sub. 75, p.5) stated:

The cost of power generation in Australia has potential to be lowered by introducing competition from privately owned and operated coal fired power stations. Development of uranium resources and the establishment of nuclear power stations also offers Australia an opportunity to improve its international competitiveness in power generation cost with a flow on to lower negotiated electricity tariffs.

With the abundance of coal resources amenable to open pit mining and located close to major industrial centres, Australia has the capability of generating electricity at a

relatively low cost by establishing large efficient power stations which benefit from economies of scale. Given appropriate vision and fortitude on the part of the developers this can be done on an environmentally acceptable and cost effective basis.

The Commission has examined the reforms to date and gone on to propose a major restructuring of Australia's electricity supply industry in its Draft Report on Energy Generation and Distribution (IC 1991).

The effect on mining and minerals processing activities (and the economy in general) of improved production and pricing efficiency in the electricity supply industry has been estimated by the Commission (see Volume 2, Appendix F). The results show that real GDP would expand by 0.7 per cent (or \$2.6 billion in 1989-90 dollars). The value of mining sector output is estimated to increase by 3.8 per cent the major beneficiary being the integrated chain of bauxite-alumina-aluminium production.

18.2 Gas

The natural gas industry in Australia is made up of three major segments - production, transmission and distribution (or reticulation). The production segment is dominated by private ownership. Transmission and reticulation are performed by Governments as well as private firms subject to extensive regulation.

Of concern to this reference is the cost of natural gas used by the mining sector. Most of it is used in processing activities.

Western Mining Corporation stated (sub. 69, p.40) that:

The cost of energy in Australia is expensive compared with the rest of the world and energy costs in Western Australia are expensive compared with energy costs in the rest of Australia. Natural gas is a case in point. Industrial users in Western Australia pay twice as much as industrial users on the eastern Australian seaboard. Worse still is the fact that WMC is paying almost four times the price per gigajoule as one of its Canadian competitors. These differences are so significant that if consideration was given to a substantial increase in output of refined nickel at some time in the future, WMC would have to examine off-shore refining seriously.

This comment serves to underline the point that prices will vary between States in Australia because costs differ for each source and there is virtually no trade to bring them into line through normal competitive pressures. The only competitive check on gas pricing in a state is provided by other energy sources within that state (eg electricity).

CRA discussed (sub. 73, p.74) the impact of gas costs on its NSW operations:

As with electricity, gas is a major input cost for CRA Group companies in NSW. Total gas consumption ... is estimated at 2300GJ in 1988. The NSW gas market is characterised by a monopolistic producer (Cooper Basin consortium), transporter

(the Pipeline Authority), and distributor (The Australian Gas Light Company), together with various final users. ... the monopoly situation in the gas supply industry is maintained by Government legislation and gas prices should therefore be subject to the same scrutiny by the IAC as other government charges. The absence of competitive pressures, centralisation of market power, and closed books mean that

increases have been imposed which consumers cannot be confident bear any relation to the cost of supply. Gas prices for some CRA Group Companies have increased by up to 76 per cent between 1982 and 1988, compared with a CPI movement of around 45 per cent for the same period. The major proportion of this increase occurred at the end of 1987 following the resolution of private arbitration hearings between AGI, and the Cooper Basin Consortium when the wellhead price of gas increased by some 60 per cent.

CRA further stated (p.75) that the price increases "have not only reduced the companies' ability to maintain a competitive cost structure but have also acted as a substantial disincentive to the further expansion of manufacturing and processing operations in the State."

The scope for improved efficiency in the gas industry

As indicated by the, albeit limited, comments in this inquiry, there appears to be scope for more efficient provision of natural gas particularly with regard to pricing arrangements.

In its Draft Report on Energy Generation and Distribution (IC 1991), the Commission has proposed a variety of measures to increase competition and efficiency in the gas supply industry. While the economy wide benefits would not be particularly significant compared to potential improvements in electricity supply (due to the small size of the gas industry), the mining and minerals processing sector would be the main beneficiary.

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PART VI

**OTHER INFLUENCES
ON
COMPETITIVENESS**

OTHER INFLUENCES ON COMPETITIVENESS

Due to the capital intensive nature of many mineral developments and the heavy reliance by Australian production on export sales, the cost of capital and the exchange rate are important determinants of the competitiveness of the commodities under reference.

In recent years, adverse economic conditions in Australia have been characterised by historically high real interest rates which have resulted in a higher exchange rate than otherwise would have prevailed. The effect of high interest rates has been to constrain the affordability of mining and processing developments. A strong Australian dollar puts our mineral exports at a disadvantage when it comes to competing on world markets.

One way the competitiveness of Australian mining and minerals processing activities can be improved is through the application of more productive techniques. Total reliance on the fruits of overseas research and development (R&D) would result in Australian activities forever lagging competitors which adopt better techniques first. Therefore, it is desirable that relevant R&D activity is undertaken in Australia. The issues are who should fund R&D expenditure – government or private interests – and what R&D projects are appropriate? Naturally, there is an incentive for private interests to undertake their own R&D. However, to the extent that sufficient of the benefits of this work may not be able to be appropriated by the private interests and/or there are spillover benefits to the wider community, there is a role for government. The form of this involvement and precisely what R&D projects to commit public funds to is a more difficult question to answer (see section 20).

19 MACROECONOMIC FACTORS

The international competitiveness of mining and minerals processing activities are sensitive to macroeconomic policies pursued by the Commonwealth Government (particularly as they affect the exchange rate and interest rates). Macroeconomic factors and the interaction between interest and exchange rates were highlighted in submissions made by a number of major mining companies and by State governments.

The cost of capital to construct mines and related infrastructure, as well as processing facilities, is an important determinant of competitiveness because of the typically large share of total project costs accounted for by such expenditure. A strong Australian dollar also puts our mineral exports at a disadvantage when it comes to competing on world markets. These and other aspects of macroeconomic policy were referred to by several participants. Analysis reported in Appendix E of Volume 2 attempts to quantify the effects of variation in exchange and interest rates on the viability of mining projects.

While this inquiry is not an appropriate forum for considering changes to underlying macroeconomic policy settings, it is important for the Commonwealth Government to be aware of their effects on the mining and minerals processing industries.

19.1 Effects of high nominal interest rates on the mining industry

MIM Holding Ltd submitted (MIM sub. 19, p.13) that "the real cost of imposing the provision of infrastructure on to mine developers is increased ... by the cost of borrowing for that infrastructure being higher for private companies than for governments." It referred (sub. 19, pp.34-5) to the contribution of high interest rates to the cost of providing infrastructure support for mining projects, and the desirability of government support for financing these outlays:

Bond rate finance should be made available for private enterprise investment in public infrastructure including housing, roads, pipelines, power stations, rail lines, ports and dams. For example, tax free low interest bonds for environmental purposes are common in the USA. In Australia, the mining industry usually has to invest in public infrastructure. This is rarely the case for other Australian industries, and generally is not the case for MIM's competitors in other countries. If the onus is to remain on the mining industry to provide public infrastructure at developing mine sites, and at the same time remain competitive internationally, it is essential that the mining industry have access to capital at competitive rates. Australia's astronomic interest rates by world standards are too high to allow sensible investment decisions. How can one compare rates of 3 to 6 per cent with those of 20 per cent plus prevailing in Australia at present? The result is that it is rarely possible for the full value of modern capital plant and equipment to be realised in Australian ventures.

The submission suggested (sub. 19, p.35) that the removal of Fringe Benefits Tax on remote area housing (see Section 13) would act as a form of compensation for the high cost of capital.

BHP made the following submission (sub. 67, pp.2-3) on the effects of interest rates:

The high rate of interest has counter-productive effects in two main ways. One is that the high real cost of capital makes it very hard to justify new projects financially. This means that Australia is inhibited in establishing a broader based minerals processing and manufacturing sector. The other is that the high rates of interest have been supporting the Australian dollar at a higher level than it would otherwise be at, which is also counter-productive to encouraging export and import competing projects.

While maintaining that interest rates have borne too much of the burden of macroeconomic restraint and should have been lower, we acknowledge that the exigencies of Australia's economic situation have required some of the burden of restraint to be borne by interest rates and that, even though they could have been lower than they were, they would still have had to be at levels that are not conducive to development of export oriented mineral projects. It is all the more important therefore that Australia addresses the underlying problem of increasing its productivity.

19.2 Effects of an overvalued exchange rate on the mining industry

MIM discussed (sub. 19, pp.17-9) the erosion of the benefits of a previously low exchange rate by subsequent high inflation:

An examination of real effective exchange rates in the 1980s indicates that, while Australian producers may have gained in competitiveness against some leading OECD nations, Asian Newly Industrialised Countries have gained a competitive advantage over Australia through greater real devaluation of their currencies against the larger OECD nations such as Japan and Germany. Despite substantial devaluations of the Australian dollar soon after flotation in 1983, inflation accelerated from the end of that same year and counteracted the competitive gains flowing from that lower dollar. The latest OECD forecasts are that high inflation will continue to erode Australia's competitiveness into the 1990s.

The submission went on to recommend, inter alia, (sub. 73, p.47) that "the support for artificially high exchange rates be removed."

EXXON Coal and Minerals Australia submitted (sub. 58, p.1) that the coal industry would have to learn to live with a high exchange rate:

Given the large additional coal supplies potentially available from overseas competitors at current or slightly higher prices, Australian producers cannot count on sustained real price increases over the next decade. Nor can they count on any further devaluation of the Australian dollar. Instead, the industry must make itself more competitive and lift returns on investment by substantially reducing its real unit costs.

19.3 Combined effects of interest rates and exchange rates on the mining industry

Western Mining Corporation Holdings (WMC) discussed the linkage between interest rates and the exchange rate, indicating that high interest rates, combined with a high exchange rate, adversely affect investment in the industry and depress returns from exports:

WMC also requests that the Commission examine the impact of macroeconomic policies based on high interest rates which maintain the exchange rate at a value higher than Australia's economic performance warrants. This reduces the incentive to invest in the mining industry and hence reduces the potential for increased exports (sub. 69, p.ii).

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 ... rates of return necessary to meet the high cost of capital (sub. 69, pp.42-3).

High interest rates drive investment demand down. At least for a time, they hold the exchange rate up, undermining our capacity to compete on world markets. The loss of international competitiveness increases our call on overseas savings - the opposite of what we need. Ultimately, reliance on high interest rates works to overcome our debt problem only through recession (sub. 69, Appendix 2, p.1).

The NSW and NT Governments referred to the effects of volatility in interest rates and exchange rates on the business performance of exporting firms. The NSW Government submitted (sub. 52, p.75):

While it is possible for a company to obtain protection against exchange rate instabilities through the financial markets, there is a cost. Even very large and financially aware companies have suffered significant losses from foreign exchange rate changes. Exchange rate volatility cannot be avoided but efforts should be made to reduce such volatility whenever possible. ...

Australia's inflation rate compared to the rest of our major trading partners has been high. However, the rate has not been very volatile and consequently it is reasonable to believe that most exporters have been able to allow for inflation in their pricing structure. While the inflation rate may be relatively high, it would seem to be of less concern in the short term to exporters than interest rate and exchange rate instabilities.

The Queensland Government submitted (sub. 55, p.26) that "in view of the relative importance of interest and exchange rates to the viability of mining operations, the Industry Commission may care to extend its analysis to include consideration of the significance of domestic interest rate structures and of the cost of obtaining hedging and risk management cover for mining enterprises."

19.4 What should the Government do?

Several mining companies advocated measures to relieve the pressures resulting from adverse macroeconomic conditions. These involved changes to the existing thrust of macroeconomic policies which were identified as the reason for high interest rates and exchange rates.

BHP discussed (sub. 67, p.2) the implications of fiscal restraint:

We think the government has chosen the wrong balance between fiscal and monetary policy, with too much emphasis on the latter. Moreover, within fiscal policy we think the government has put the wrong emphasis of restraint as between its capital and current expenditures. Too much of the restraint has fallen on the capital spending side and that has adverse long run implications for all industry, by way, for example, of failure to maintain and develop infrastructure.

The Australian Goldmining Industry Council submitted (sub. 85, p.1):

There is a consistent, obvious and rational case for taxation reform, which ideally should entail the complete replacement of income taxes with a broadly-based consumption tax. In the absence of such a radical reform, the Council submits that corporate tax should be abolished, with taxation of income in the hands of shareholders, via income tax, capital gains tax or withholding tax (in the case of foreign shareholders). A consumption tax can be structured to meet revenue needs and to replace other indirect taxes.

19.5 Conclusions

High interest rates deter borrowers and may act to reduce the amount of capital employed in activities under reference. High capital costs reduce Australia's international competitiveness as a location for new or additional investment and can prevent the commencement of new mining projects. In the longer term, high interest rates can lead to a decline in the level of industrial infrastructure which will impede economic development.

There is a strong link between the level of interest rates and the exchange rate. High interest rates attract overseas capital seeking more attractive returns, which places upward pressure on the exchange rate. A high Australian exchange rate relative to our overseas competitors places exporters at a disadvantage. It reduces both the returns from exports and the incentive to undertake the investment necessary to increase exports. Exchange rate volatility compounds the problems facing the mining industry, requiring the purchase of hedging and risk management cover. It also decreases the incentive to search for new opportunities or expand existing markets.

20 RESEARCH AND DEVELOPMENT AND ACCESS TO TECHNOLOGY

Like other economic activities, research and development (R&D) - the outcome of which is often new (or at least better adapted) technology - is vital to maintaining the international competitiveness of mining and mineral processing activities in this country. This section examines the role of the Commonwealth Government in research and development (R&D) relevant to mining and minerals processing activities. Reasons for government involvement in R&D are discussed, as well as alternative forms of intervention. Also discussed is the role of technical training and the treatment of exploration expenditure as an R&D activity.

20.1 Introduction

To remain competitive mining and minerals processing activities in Australia must continually find ways of doing things more cheaply and using lower grade ore. This requires continual advancement in exploration, mining and processing technology. While new technology developed overseas can be bought or outright or accessed through foreign ownership arrangements, there is a need for a substantial amount of 'home-grown' effort - since Australian conditions can differ markedly from those under which the original technology was developed, and continually having to acquire and adapt overseas technology keeps Australian industry one step behind.

At face value, it could be expected that mining and minerals processing companies have an incentive to develop technology which improves their competitiveness. But since technology tends to generate 'spillover' effects which may benefit other activities and in respect of which it may be hard to charge, it may be that private companies - left to themselves - will not undertake the socially efficient amount of R&D. For example, mining-oriented research on environmental problems may discover ways of solving wider environmental problems. How should the government encourage such beneficial R&D to be undertaken?

Mining and minerals processing companies may also be constrained from undertaking desirable R&D because of lack of suitably trained workers, large initial costs, long lead times and high degrees of risk. How can government overcome these problems (if they exist) in the mining sector?

20.2 Is there enough R&D in the Australian mining sector?

The socially optimal level of R&D depends on the extent to which private R&D results in spillover benefits to the economy, in respect of which it is impossible for private companies to recoup sufficient of their costs to justify undertaking the R&D in the first place. It is commonly argued that, on the basis of international comparisons of R&D expenditure, Australia does not undertake sufficient R&D. A recent study of seven developed countries by the Australian Science and Technology Council found that Australia had the lowest spending on R&D as a percentage of GDP. The study also found that in 1987, Australia spent US\$43 per head on R&D, while the United States spent US\$61 and West Germany US\$91.

However, such figures are too aggregated to infer much from. A more fruitful approach to the issue in the present context is to investigate whether there are barriers to private mining interests undertaking R&D, and then what will be a largely subjective decision about whether government should encourage more R&D because of spillover benefits.

Can mining companies appropriate the benefits of their R&D?

An ability to appropriate enough of the benefits of R&D to justify commitment of the resources involved is a powerful incentive for private interests to undertake R&D. Accordingly, CRA suggested (sub.73, p.12) a passive, though important role for government:

... the leading role in research, development and new technology should be taken by the private sector with governments playing a supporting role through the creation of a dynamic business climate.

Government can also aid the ability of private companies to appropriate the benefits of their R&D through a patent system. Patents can be useful where the products resulting from R&D are easily copied, or where the lead time over rivals is insufficient to enable R&D expenditure to be recovered. In many cases, however, products or processes may be unpatentable, or the costs of seeking and enforcing patents may make them not worth the effort and expense.

MIM Holdings Ltd is a large mining company which has made significant use of R&D to develop processes which have extended the life of its low-grade ore bodies, reduced costs and improved productivity. In conjunction with CSIRO it has undertaken strategic research in order to overcome particular difficulties which it faced. Since it is in a position to capture most of the benefits flowing from R&D, it has been able to determine the appropriate directions for research based on its assessment of its present and future interests. Two processes which have been developed are the ISASMELT process, an advanced process for smelting non-ferrous metals, and the ISA PROCESS for copper smelting. These technologies have been marketed internationally.

The R&D arrangements for the coal industry highlight the importance of letting industry self interests determine R&D effort, with the government only intervening if there are barriers to this or clear indications of external benefits outside the industry. As discussed in detail in Section 22, coal companies make compulsorily contributions to the Coal Research Trust Account (CRTA)/National Energy Research Development and Demonstration Council (NERDDC). A number of companies now pay more than \$1 million annually. The industry is concerned that third parties (bureaucrats) make decisions about how these considerable sums of money are spent and would naturally prefer to have greater (even exclusive) say so as to ensure research is directed to industry needs. The Commonwealth Government is examining whether to set up a Coal R&D Corporation (along the lines of the Meat and Livestock Corporation) which would represent a move towards greater industry control over its own affairs. However, the industry has expressed some concerns about this proposal and has outlined an alternate system of collecting and managing industry research funds.

The CSIRO Division of Minerals, Energy and Construction expressed concern about the coal industry having total control of industry funds for research, as it felt that the coal industry is mainly interested in supporting R&D in relation to conventional technology. It submitted (sub. 61, p.18):

Awareness of new technology developments and their significance has generally been low, and support for medium to long term innovative R&D has also been relatively poor. CSIRO's expertise and capabilities have therefore been undervalued and underutilised by industry. ... The impending corporatisation of the functions of National Energy, Research, Development and Demonstration Council may well tilt the balance of research support further towards conventional technology and short term incremental improvements because of the predominance of relatively conservative industry attitudes.

CSIRO may or may not be correct in its view that the coal mining industry has a conservative attitude to investment in R&D. However, it should be noted that when the industry expresses an opinion on its preferences in R&D, it is in effect saying what it would like to be done with its own money. The survival of the industry depends very much on its judgment about what is important to its own future and profitability. At the same time, it is entirely appropriate for CSIRO to place greater weight on the longer-term outlook for the industry and take a strategic view of R&D requirements. That is, CSIRO is expressing the view that there are spillover benefits of such research to the wider economy. The trick is second guessing the potential for external benefits. (The case for government involvement in R&D on the basis of externalities is discussed further below). Industry should not be expected to contribute to the cost of strategic R&D which it does not consider to be in its commercial interests.

Threshold problem

R&D identified by a company as potentially beneficial maybe beyond the scope of the company both financially and technically. It may then be in the interest of the company to collaborate with other companies which may also benefit, or to establish a joint research program with universities and/or bodies like CSIRO.

Where there are many producers of a fairly homogeneous mineral product most of whom will benefit from advances in technology which is readily copied when available, the temptation exists to form a central R&D effort. The coal industry and its desire to manage its own R&D contributions seems to be such a case. With an industry approach, the problem of the minimum efficient scale for R&D effort may not be a problem.

In circumstances where products and technology are more diverse (such as mineral processing) a technological breakthrough can give a substantial boost to competitiveness, because of greater difficulty in copying and the likely use of patent protection. If a threshold problem arises, a company is more likely to collaborate with universities and CSIRO rather than let other producers in on the secret.

There is no direct role for government in response to threshold problems. Either the industry looks after itself through joint industry arrangements or the government is passively involved through funding of CSIRO and education institutions.

Staff and education

The availability of suitably qualified and experienced technical staff in the mining industry and research institutions is a crucial input to any R&D effort. Recruiting from overseas or from a 'tight' domestic supply can prove very costly. Associate Professor R. T. Pidgeon submitted (sub. 54, p.2) that " ... the level of training of graduate and postgraduates is probably the most significant long term factor controlling future innovation, efficiency and competitiveness of the industry ... universities should be targeted by the Commission for special support for maximising the integration of mining and minerals research and high level training of technologists."

Pasminco recommended (sub.89, p.6) that there should be a renewed focus by both Federal and State Governments and educational authorities on improving the capability and facilities for training young Australians in the fields of engineering and applied science.

The training of technically qualified staff for the mining industry is the responsibility of the education system in the first instance, rather than for the Commonwealth Government. Any shortages in the supply of graduates in a particular discipline should be dealt with within the higher education system. However, it is recognised that there is a degree of market failure in the training by companies of specialist technical staff, since in the absence of suitable incentives, there is nothing to prevent staff from leaving after being trained.

Bridging the gap between research and development

The experience of Mr A. V. Barker indicates that the issue of initiating and conducting research may be less of a problem than obtaining support for the development and demonstration of new mining processes and machinery. He indicated in his submission (sub. 106) that there was no Australian interest in his inventions and that he was forced to seek business partners overseas - a lost opportunity for Australia? With limited financial resources, Mr Barker has faced substantial problems in obtaining backing from financial institutions and the mining industry generally.

Only in hindsight will the mining industry and financial institutions be proved right or wrong in their assessment of the worth of the research efforts of the A.V. Barkers of Australia. The only role government can play in overcoming problems of this nature is through competency in the assessment of applications for public R&D grants and in the provision of marketing and business advice services.

20.3 A role for government because of spillover benefits

The earlier discussion outlined the role government could play if there were barriers to the efficient conduct of R&D by private companies responding to their own self interest. A further role for government in facilitating R&D effort is justified if R&D not undertaken privately would have net benefits to the nation.

There are three main ways in which government can encourage more R&D than is privately profitable: government provision of R&D; taxation incentives; and selective grants. Each instrument has its advantages and disadvantages.

Direct government involvement in mining and minerals processing technology occurs through funding of CSIRO, BMR and public education. AMEC noted (sub. 15, p.134) that the Government sector provided 91 per cent of R&D expenditure for agriculture and 88 per cent for forestry and fishing (mostly via research performed by government institutions) while for the mining sector, government and the private industry each funded around 50 per cent of R&D expenditures (with the actual research being performed largely by the private sector).

The NSW Government submitted (sub. 52, p.5) that "additional Commonwealth funding for R&D and training in specialist technologies such as metallurgy would greatly benefit the [mining and minerals processing] industries." The amount of government spending on mining R&D is a subjective opinion about the extent of spillover benefits. Like most issues involving money, the preference by those receiving funds is usually for more rather than less. However, Green (1990) explains some reasons why more government funding of basic research may be justified:

There are only three universities with a significant concentration of effort in ore genesis (North Queensland, Tasmania and Western Australia). CSIRO's effort's are hindered by its external earning requirements which restrict it to shorter term practical problems and the BMR's new role in mapping will mean that it will have fewer resources to devote to genetic problems.

Private self interest would appear to lead to a preference of mining companies to undertake applied research on the basis that the lead time is probably shorter than for basic research and is more directed at specific problems the organisation has encountered or foreseen. While basic research is probably less attractive to mining companies it is more likely to have spillover value to other parts of the economy. (The argument between the coal industry and CSIRO about the use of research funds raised by the industry may signal the different incentives to conduct basic or applied research).

Broadly speaking, government funds for mining R&D should be initially directed at basic research. Dabbling in applied research could occur on the basis that the basic research indicates likely demonstrable spillover benefits outside mining activities. Government research bodies could also become involved in applied research as part of joint projects with mining companies which require technical assistance and which pay their share of the costs.

The danger of government being directly involved in applied research might best be exemplified by the discussion about what activities the BMR should perform. The industry argued and the Commission agrees that the activities of the BMR should be restricted to basic functions such as mapping and not be involved in commercial exploration. Just because the BMR's public good activities indicate to themselves a potentially prospective area, they should not proceed with their own commercial exploration effort. The actual task of the CSIRO drawing a line between basic and applied research (and deciding what basic research is beneficial to extend) is very difficult and best carried out by those with experience. The Commission's role is to broadly indicate how differences in the provision of basic and applied R&D can affect the efficient use of the community's resources.

Pasminco referred (sub. 89, p.57) to the well-established links developed between research institutions and industry in the 1960s and 1970s and the role each played:

However, during the mid 1980s the trend changed dramatically through reduced government funding of research at universities and CSIRO and the establishment of the principle of increased industry funding of R&D activities. As industry is generally unwilling to fund basic research, both universities and CSIRO look much more to applied research and come into conflict with industry based R&D activities. This competition for the limited industry R&D funding has unfortunately damaged several of the collaborative developments in the mining industry between government and industry-based R&D groups. Pasminco strongly believes that a return to the original principles of a strong link between government funded basic research and collaborative applied R&D for the mining industry will be beneficial.

Direct government involvement in basic research is not the only way of encouraging R&D (which may have spillover benefits) to be undertaken when private interests normally would not do so. Taxation concessions (such as the 150 percent deduction) make R&D projects more attractive than otherwise. A drawback is that they tend to be blunt instruments since such concessions also subsidise R&D which would have been done in their absence. To some extent this can be avoided by having qualifying rules but, this increases administrative costs.

Selective grant schemes are potentially very effective forms of support, as ideally only those projects with low private (but large social) benefits could be encouraged. However, such schemes entail high informational and administrative costs and face difficulties in developing efficient selection criteria.

An increasingly important area of R&D in mining and minerals processing which is likely to have spillover benefits to the wider community is environmental problems. CSIRO indicated (sub.61, p.20) that this may be an area for government intervention:

Environmental care does not in general contribute to the production process and consequently industry does not invest very heavily in external environmental research such as is conducted by CSIRO.

The Department of the Arts, Sport, the Environment, Tourism and Territories said (DASETT, sub. 65, pp.7, 14-5) that the mining and minerals processing industries will need to ensure that mechanisms are in place to take advantage of any new technologies regarding 'greenhouse' emissions; will need to be aware of research into recycling of resources; and should be encouraged to undertake more research into renewable energy resources financed by a levy on the level of production of non-renewable resources.

DASETT acknowledged that the mining sector can play a prominent role in solving many environmental problems. The issue is how to encourage private R&D in these areas which the industry does not find profitable to do themselves but which would benefit the nation. Their suggestion is a compulsory levy. As the coal industry example indicated, compulsory levies have drawbacks. The challenge is to find the most appropriate form of government intervention - when it is justified.

20.4 Conclusions

The potential to profit from their own investments is a powerful incentive for mining and mineral processing companies to undertake R&D. Without advancements in technology, Australian operations will lose competitiveness with companies overseas which regularly update their technology in a continual search for cost reducing innovations.

However, there may be some impediments to private interests undertaking R&D which they consider is profitable - for example, lack of patent protection, lack of technical staff, the possibility of minimum efficient scales for R&D. The Commission found no significant problem in these areas and certainly no direct role for government in overcoming them. Rather, a passive role through funding of public education institutions and the administration of a suitable patents system seemed to be the most appropriate role for governments in Australia.

A much more prominent role for government in R&D for the mining and minerals processing industry can be justified on the basis that there may be R&D which private mining interests does not find attractive, but which would benefit the nation through spillover benefits. The potential seems greatest in addressing environmental problems and basic research into process technology and geological theories. The issue is to then find the most efficient instrument(s) by which the government can elicit the relevant R&D. Such instruments include research by public bodies (eg the universities, CSIRO and BMR) and taxation and budget mechanisms.

The Commission concludes that existing policies for R&D and access to technology do not pose significant constraints on the mining and early-stage minerals processing sector in Australia. In a world where environmental problems are becoming increasingly important there may be a case for policies which encourage mining companies to undertake more environmental R&D for the benefit of the nation.

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PART VII

**SPECIAL TOPICS
AND CASE STUDIES**

SPECIAL TOPICS AND CASE STUDIES

This Part presents four examples which highlight many of the problems identified in the report. These are: Coronation Hill and the Kakadu Conservation Zone (section 21); the Coal Industry (Section 22); the Uranium Industry (Section 23); and the office of the Supervising Scientist (Section 24).

The Coronation Hill example has been well publicised. It highlights the conflict which can arise regarding alternative land uses. This case is further complicated by Aboriginal claims over the land. At the heart of the problem is the lack of consistent, well-defined and well-known government decision-making processes regarding choices between alternate land uses and for resolving conflicts. This issue has now been referred to the Resource Assessment Commission.

Both the coal and uranium industries are subject to substantial Government regulation which is more stringent than that applying to other mining activities. Like all regulations, it is important to ensure that the reasons for their imposition remain valid – particularly since regulations interfere with the operation of normal markets (often producing undesirable outcomes).

The Office of the Supervising Scientist is the Commonwealth Government's watchdog when it comes to overseeing environmental aspects of the Alligator Rivers Region in the Northern Territory, in which the Ranger uranium mine is located. The example highlights the overlapping responsibilities and legislation at different levels of government which can arise, particularly for sensitive issues such as the environment and uranium mining. Like all regulatory goals it is important that they are achieved in the most cost-effective way.

21 CORONATION HILL AND THE KAKADU CONSERVATION ZONE

This section looks at two recent decisions which exemplify many of the problems discussed in detail elsewhere in this report. The Coronation Hill decision (or non-decision) and the decision to greatly reduce the Conservation Zone have been taken by the Commonwealth Government against a background of overt and covert 'warring' between miners and conservationists. At issue are questions such as what activities should or should not be permitted in national parks, land use decisions generally, exploration and mining approval processes, sovereign risk and the problem of taking into account Aboriginal inputs into decision-making processes whose outcomes vitally affect their interests. In many ways the story bears testimony to the dangers of making a series of ad hoc decisions in response to intense lobbying, but it is also a good example of the potential benefits likely to flow from developing better approaches to land use decisions.

21.1 The Coronation Hill project

The Coronation Hill Joint Venture (CHJV), comprising BHP Gold Mines (45 per cent interest), Pioneer Minerals (45 per cent) and North Broken Hill Holdings (10 per cent), proposes to mine Coronation Hill (or Guratba as the Aborigines know it) for gold, platinum and palladium.

The 16 square kilometre project area is situated adjacent to the South Alligator River some 100 kilometres upstream from the World Heritage wetlands of Stage I of Kakadu National Park. It lies within the (now greatly reduced) Conservation Zone which in turn is surrounded by Stage III of the park.

The proposed project comprises the mine, processing plant, residue and water management systems, overburden and run-of-mine stockpiles and associated infrastructure (eg access roads). The mine would initially be an open pit operation, with underground mining commencing in the third year and operating in parallel with the open pit for at least a further six years.

According to CHJV's December 1988 Draft Environmental Impact Statement, initial annual production is expected to be 1 500 kg of gold, 30 kg of platinum and 260 kg of palladium (with peak annual production estimated to reach 60 kg of platinum and 525 kg of palladium).¹ Proven reserves should sustain a mine life of approximately nine years, with further exploration during the mining phase expected to discover additional reserves.

Peak production would involve a workforce of 180, with 100 on site at any one time. CHJV estimate initial establishment and construction costs at \$30 million, with exploration between 1984 and 1988 having already cost \$8 million.

¹ Relative to current Australian min production of platinum group metals, these are very significant proportions.

Aborigines have an interest in the project

A large complex of Aboriginal sacred sites, ranging over approximately 260 square kilometres, takes in part of the project area and includes Coronation Hill (Guratba) itself. The whole area also lies within the 'Sickness Country' - a sacred site claim of some 6 200 square kilometres which is awaiting determination. In addition, there is an Aboriginal land claim over the whole of Stage III of the park which has yet to be heard.

Others also have an interest

Apart from the joint venturers and local Aborigines (in particular the Jawoyn people who are the traditional owners), others with an interest in the project (and the area more generally) include:

- the mining industry (in so far as what has happened and what has yet to transpire has ramifications for the industry as a whole);
- conservationists (who are interested in land use decisions generally and most particularly in relation to national parks); and
- the Commonwealth and NT governments and their agencies (which will largely shape the outcome by the decisions which are made).

But before describing the stances taken by the various groups with a stake in the outcome, it is appropriate to recount some of the history of the region, in order to set the current imbroglio in perspective.

21.2 History of the region

Dispossession

Aborigines have been living in the Alligator Rivers region for thousands of years. Kearney (1988, p.2) notes:

Contact between Aborigines and non-Aborigines in the region goes back at least to 1862 when John McDouall Stuart traversed parts of the area ... He reported favourably on the potential of the lands north of the Roper River for pastoral activity ... The subsequent development of pastoralism and mining, and particularly the construction of the Darwin to Pine Creek railway in 1887-9 led to an increasing influx of non-Aborigines into the region.

It was the stocking of the pastoral country, which commenced on a large scale from 1878-80, which led to the most serious problems for the native Aboriginal inhabitants. It disturbed their waterholes and drove away wild game. The forcible incursions on their traditional lands presented many problems for them; they became dependant on the cattle stations and on their rations. Their labour was regarded as a natural resource. The introduction at the same time of grog, opium and disease had a degenerative effect. Unquestionably, over this early period the Aboriginal population in this region decreased, but the extent to which this occurred cannot be documented.

In the early 1930s, Joe Callanan took up the Gimbat lease as a pastoral property. In 1947, he applied for a mining lease covering a hill in the middle of his property to mine for copper. He named it Callanan's Prospect.

Further disruption to Aborigines in the area

World War II and the threat of attack from the north caused additional disturbance to the lives of the Jawoyn:

Aborigines from areas to the north were relocated south on a massive scale. The Army needed labour and established Aboriginal compounds at Katherine and Mataranka and elsewhere. After August 1942 Aborigines were not supposed to remain north of Edith River. [Edith River is some 90 km south-west of Coronation Hill.] The Jawoyn and the others were moved to the Army compounds. (Kearney 1988, p.4)

The fact that at least since World War II the majority of senior claimants have lived most of their lives in the southern part of what was Jawoyn traditional country is probably also a factor which influences their recall of sites, and their knowledge of and interest in particular sites and areas. (Kearney 1988, p.33)

Naming of Coronation Hill

Geologists from the Bureau of Mineral Resources (BMR) had noted geological similarities between the South Alligator Valley and the Rum Jungle area (where uranium had been discovered). In 1953, a BMR officer persuaded Callanan to show him any mineral outcrops on the Gimbat lease. Joe took him to Callanan's prospect. The geologist discovered some secondary uranium mineralisation and recorded some interesting readings on his geiger counter. Since it was the day of the Queen's coronation, he (re)named the site 'Coronation Hill'. BMR's subsequent exploration for uranium at Coronation Hill was unsuccessful.

Discovery and mining of uranium at Coronation Hill

Having taken over the mineral lease, United Uranium NL discovered uranium at Coronation Hill in 1956. Other deposits were found in the surrounding area, and the region was extensively mined by small-scale operations for a few years. Although uranium was the main target, some 300 kg of gold was also extracted from the South Alligator Valley during the 1950s. Known stocks of uranium in the region were mined out by the end of the decade, but sporadic exploration continued for another 20 years.

National park proposed in the area

In 1969, following various proposals for a national park in the Kakadu region, the Minister for the Interior approved, in principle, a national park of some 2 600 square kilometres. This proposed park coincided roughly with what is now Stage I of Kakadu National Park. By 1971, prospecting authorities (and later exploration licences) had been granted over a large proportion of the proposed park. The Ranger, Jabiluka, Koongarra and Narbalek uranium deposits had also been discovered. All but the last of these lay inside the proposed park boundaries.

Kakadu National Park declared and miners reassured about uranium finds

In December 1973, Cabinet agreed to establish Kakadu National Park, covering some 3 800 square kilometres. Following this announcement, the Federal Minister for the Northern Territory wrote to mining companies which held leases in the proposed park area to reassure them that, under the new legislation allowing for the creation of national parks, there would be provision for prospecting to be carried out under certain conditions. The proposed park boundaries were not formally gazetted until May 1975.

National Parks and Conservation Zones

The Commonwealth *National Parks and Wildlife Conservation Act* (NPWC Act) was passed in 1975 and applied only in areas of Commonwealth jurisdiction.

The NPWC Act provides the mechanism for the Commonwealth to establish a protected area to conserve significant nature conservation values. In most cases, this would be a national park or nature reserve. In certain situations where there is a likelihood of mineral prospectivity, a conservation zone may be established (ANPWS sub. 83, p.2)

The Act provided for exploration and mining in national parks, subject to a plan of management.

Ranger Inquiry complicates the situation

In July 1975, the Ranger Uranium Environmental Inquiry was commissioned under Justice Fox, following completion of an Environmental Impact Statement for the proposed Ranger uranium mine. The Inquiry presented two reports, one in October 1976 and the second in May 1977. Justice Fox's recommendations were not confined to the Ranger project, also addressing issues raised by the proposed national park. He recommended on ecological grounds that, if possible, the national park include at least one large total river catchment. He suggested the South Alligator River would be a good choice, and proposed the Government resume the Gimbat and Goodparla pastoral leases (since they roughly comprised its catchment area).

Justice Fox did not recommend exclusion of exploration and mining from the park - only that they should not have priority of land use. The Inquiry recommended Ranger be allowed to proceed only if an overall land use plan for the Alligator Rivers Region was developed first (including Aboriginal title to much of the land and establishment of a national park over most of the region).

Stage I of Kakadu National Park (comprising some 6 100 square kilometres) was finally proclaimed on 5 April 1979. However, it was not until April 1981 that the first management plan for the park came into effect. The plan countenanced exploration and mining, provided certain environmental conditions were met.

Ranger officially opened in November 1981.

Extension of Kakadu to include Stage II

Stage II (adjoining Stage I) of Kakadu National Park (comprising some 6 900 square kilometres) was proclaimed in February 1984 (refer Figure 21.1).

Guratba declared a sacred site

In August 1984, the Coronation Hill Joint Venture (CHJV) began drilling for gold at Coronation Hill. The site proved promising not only for gold - platinum and palladium mineralisation was also discovered. The CHJV continued exploring at Coronation Hill until October 1985, when the NT Aboriginal Sacred Sites Protection Authority (ASSPA) declared a new 260 square kilometre sacred site network that included Guratba (the Aboriginal name for Coronation Hill). This meant the CHJV had to seek the approval of the Aboriginal traditional owners (through the ASSPA) for any future operations, including further exploration work. Permission to continue exploration was granted by the ASSPA in July 1986, following extensive consultations between the CHJV and the Jawoyn Aborigines. Drilling recommenced at Coronation Hill in August of that year.

Proposal to ban mining in Kakadu National Park

On 16 September 1986, the Minister for Resources and Energy, Senator Gareth Evans, and the Minister for the Arts, Heritage and Environment, the Hon. Barry Cohen, released a joint statement endorsing a revised Plan of Management for Kakadu National Park which would effectively prevent any new mining activity within the park boundaries. When the Senate debated the proposal, a motion of disallowance was proposed with the aim of modifying the plan to permit mining within the park. The motion was eventually defeated, and the 'no mining' management plan took effect.

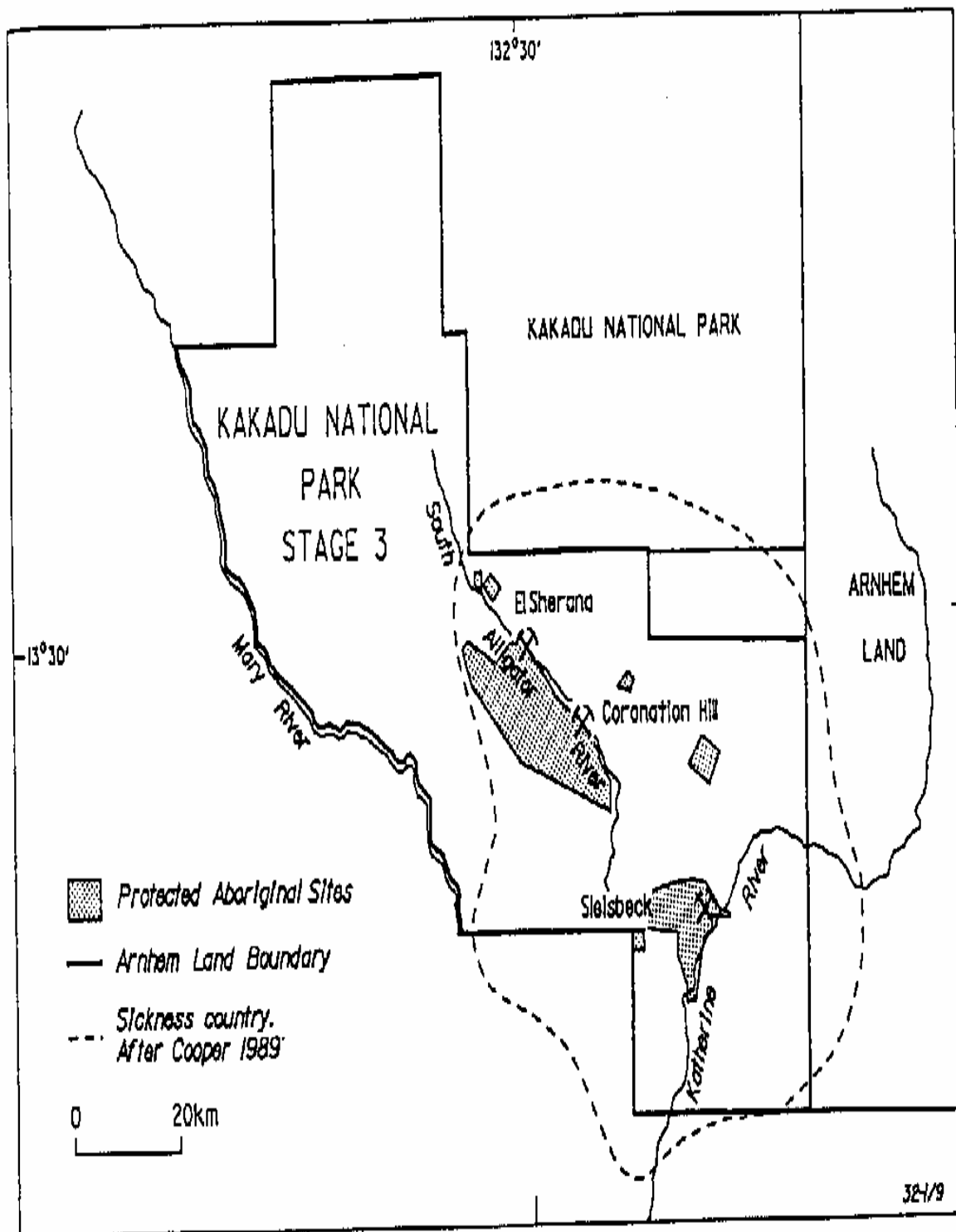
Decision to further enlarge the park

The joint statement (Press Statement 1986a, p.2) also foreshadowed the Government's intention to extend the park by a third stage:

In a further major decision, the Government agreed to enlarge the boundaries of the Park into the existing Gimbat and Goodparla leases, which between them cover 6 726 square kilometres and include a large area of the catchment of the South Alligator River. Significant areas of these pastoral leases - including the area covered by the BHP-led Coronation Hill exploration project - have been the subject of previous mining activity, and at least a third of the total area has been assessed by the Bureau of Mineral Resources as highly prospective for minerals, especially gold and platinum.

Under these circumstances, Cabinet has agreed that the further extension of the Park should be subject to arrangements which will ensure that a full assessment of the resource potential of the area takes place. The details of the Stage III extension, including the mechanisms to ensure the full environmental protection of the South Alligator River system, will be the subject of further consideration by the Cabinet and Caucus in the near future.

Figure 21.1: Kakadu National Park



Source: BMR

The Government has also given specific consideration to the future of the Coronation Hill mineral lease (located within the Gimbat pastoral lease) which is presently the subject of intensive exploration and evaluation for gold and platinum by a joint venture comprising BHP, Noranda Pty Ltd and EZ Industries. It has been agreed that the economic potential of this project is such that provision should be made for the exclusion from any National Park extension of an appropriate mining lease area, and the project allowed to proceed subject to normal environmental, Aboriginal heritage and related clearances.

Miners further reassured

A subsequent joint statement (Press statement 1986b) made on 16 December 1986 clarified the previous statement and spelt out details of the Stage III extension. It announced over 4 000 square kilometres of the Gimbat and Goodparla leases would be incorporated into Kakadu National Park, also stating (p.2):

In addition to its high conservation value, the Gimbat and Goodparla area contains one of the most highly prospective mineral provinces in the world. The Government believes that it is in the national interest that these resources should be properly identified.

The Government has therefore decided that approximately 35 per cent of the Gimbat and Goodparla pastoral leases (some 2 200 square kilometres) will remain outside the Park at this stage. This area will be declared a Conservation Zone under the National Parks and Wildlife Conservation Act. A five year exploration program will be conducted to help determine, by the end of that period, which areas should be put into the Park.

The Government's intention is that ultimately as much of the Conservation Zone as possible will be incorporated in the Park and that only mining projects of major economic significance, not merely economic viability, will be excluded from the Park.

The statement also reaffirmed the Government's position that the Coronation Hill mining lease should be excluded from the park because of its economic potential. In closing, the statement described (p.3) the Government's decisions as:

... a realistic and balanced approach to the protection of the area taking account of the Government's firm undertaking to conserve Australia's natural and cultural heritage and to recognise the importance for the minerals industry of access to highly prospective areas, placing such access under strict environmental controls.

Establishment of a Conservation Zone

The decision to establish a Conservation Zone (CZ) in Stage III represented a compromise between the Resources and Environment portfolios, following two years of ministerial and departmental debate. An important feature of the compromise was the decision to make the CZ a single area comprising a maximum of 35 per cent of the total Stage III area. This essentially arbitrary figure made finalising the boundary of the CZ a challenging task. Draft boundaries were drawn up in an

attempt to include areas with the highest potential for mineral deposits of major economic significance, while simultaneously excluding Aboriginal sacred sites, areas of particular environmental significance and areas with poor access. The resulting CZ was understandably a complex shape (refer Figure 21.3).

Arguments escalate over the proposed CZ boundary

Following a government announcement of the proposed CZ boundary, various changes were proposed by the mining industry, environmental groups, the NT Government and the National Parks and Wildlife Service. Consensus on a final boundary was an unlikely outcome of this process, and protracted debate continued.

The CHJV prepares its environmental impact statement

Meanwhile, guidelines for the Coronation Hill Environmental Impact Statement (EIS) were finalised in June 1987 and the CHJV formally began preparing its EIS.

On 5 June 1987, the Government announced it was proceeding with the declaration of Stage III of Kakadu National Park and proceeded to gazette Stage III with the draft CZ boundary "... notwithstanding the need for some redefinition of the conservation zone boundaries to take account of further geological information and to correct minor anomalies and inaccuracies." (News release 1987) Cabinet agreed that the Ministers for Resources and Environment, in consultation with the Australian Conservation Foundation, should try to finalise the CZ boundary within ten weeks. Declaration of Stage III before finalising the boundaries occurred a month or so before the 1987 Federal election.

After a detailed review of the CZ, a new boundary was developed which reflected a different trade-off between areas of high prospectivity and significant environmental value. The revised boundary would have resulted in a decrease in size of the CZ and an increase in the proportion of the catchment area of the South Alligator River included in the park. It was preferred to the gazetted boundary by most of those with an interest in the area and the revised boundary was proposed to the Australian Conservation Foundation (ACF) in August 1987. However, the whole process was overtaken by subsequent events.

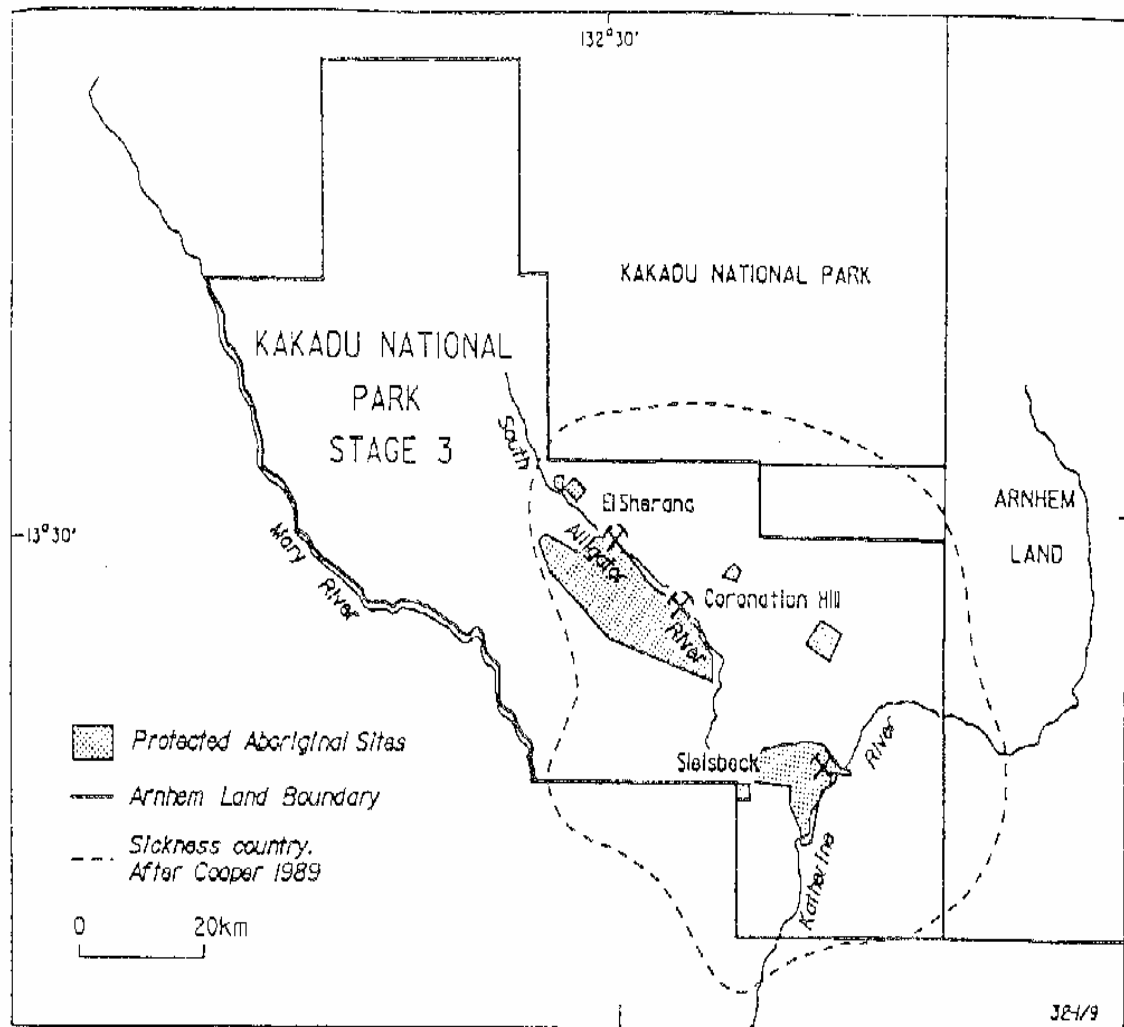
Aboriginal objections to mining Guratba

The Cooper report

On 18 September 1987, the ASSPA released the 'Cooper Report', a report by one of their officers (Cooper 1987), which described the main objections of Aborigines to exploration and mining in the Gimbat half of the CZ, on grounds that this area lay within 'Sickness Country' - an area of approximately 6 000 square kilometres comprising a network of overlapping sacred sites and their buffer zones (refer Figure 21.2).

Part of Jawoyn traditional belief is that in the 'Dreamtime', ancestral beings travelled over the country, bringing shape to the landscape. Bula is the dominant being in the region. According to the Cooper Report (p.2):

Figure 21.2: 'Sickness country'



Source: BMR

The Bula 'Sickness Country' is a striking example of the concept of the present landscape being a transformation of the Dreaming. Many features, such as hills and various sites have their origins in actions performed by Bula, however, the integrity of the 'Sickness Country' is bound in two properties which are not necessarily site specific.

The first of these relates to the actions of Bula during the Dreaming when he hunted throughout the area. Bula is said to have left his essence (ngan-mol) throughout the 'Sickness Country' as a result of a secret ritual practice which may still be performed today. The gold in the ground at Coronation Hill, for instance, is regarded by Jawoyn as the ngan-mol of Bula.

The second property is the result of Bula's existence in the present landscape. The Bula ancestor beings finally went underground at a number of locations in Gimbat where they remain deep in the earth. These Bula sites are believed to be 'sensitive' and are connected underground to form a network. As a result, disturbance at other sites or areas of the 'Sickness Country' can be sensed at the main Bula sites.

Any disturbance of Bula is believed to have potentially apocalyptic consequences. Near major Bula sites, even accidentally kicking a rock may be a sufficient disturbance. At any point within the 'Sickness Country', it is believed major disturbances - such as explosions - would disturb Bula.

In discussing the effects of previous mining activity in the area, Cooper records transcripts of interviews with Jawoyn Aborigines, describing the fear they have experienced at the violation of Bula sites. Many Jawoyn left the area in the 1950s out of fear that mining activity would bring disaster. A near fatal hookworm epidemic which struck an Aboriginal labour camp in the 1950s was attributed to Bula, and various earth tremors in the area have similarly caused concern. With regard to more recent activity in the region, Cooper noted (p.(iii)):

The process of considering mining activity within the 'Sickness Country' has resulted in a number of negative social and cultural impacts on the Jawoyn, mostly related to anxiety about the disturbance of Bula. Recent earth tremors have been interpreted as warnings from Bula. Other problems relate to the constant pressure of consultations.

Cooper (p.6) also made an interesting point regarding the Jawoyn's method of protecting their sacred sites from the threat of pastoralists and miners:

Faced with such effective powerlessness, Aboriginal custodians were forced to adopt subtle strategies in order to protect sites and to maintain traditional responsibilities. Frequently this involved working in or close to their own country whether it was mining or pastoral work, in order to monitor activities and, if possible, encourage them away from important sites. During the wet season, when work was temporarily halted, custodians could visit sites, teach young people and conduct ceremonies.

The report concluded that any exploration or mining activity in the south-eastern half of the CZ would be inappropriate according to Aboriginal tradition, and recommended the proposed changes to the CZ boundaries and subsequent granting of exploration rights should not proceed until traditional Aboriginal concerns were fully documented.

Disagreement over the CZ boundary continues

The Prime Minister and other relevant ministers met with the ACF on 24 September 1987 to discuss the proposed CZ boundary changes. The Director, Mr Toyne, made it clear that the ACF was opposed to the CZ on principle, expressing numerous concerns (particularly about protection of the South Alligator River catchment area).

In the CHJV submission to this inquiry, they note (sub. 27, p.7):

The Prime Minister, on 9 October [1987], provided written assurances to BHP that although there were discussions about some realignment of the Conservation Zone boundaries there had been "no change in Government policy on the conservation zone concept or in relation to Coronation Hill".

The Department of Aboriginal Affairs wrote to the Northern Land Council (NLC) on 18 October 1987, requesting it consult with Aboriginal traditional owners to determine their opinion on the proposed new CZ boundary. The NLC wrote back in November, advising that the Aborigines were against any exploration or mining in the south-eastern half of the CZ, because of its spiritual significance.

The Ministers met again late in December 1987 to further discuss the proposed boundary changes in light of the NLC's response. Senator Richardson, then Minister for the Environment, and the Hon. Mr Gerry Hand, Minister for Aboriginal Affairs, flew to the NT to speak with the NLC, the CHJV and the Jawoyn Aborigines - the traditional owners. The Jawoyn appeared far from unanimous in opposing mining in the area (see Volume 4 - Who speaks for the Jawoyn for evidence of this). This was reflected in a letter the NLC subsequently wrote to the Minister for Aboriginal Affairs on 15 January 1988, describing four main areas of concern. One of these was:

A lack of consensus exists between generally older custodians who know the Gimbat area and relatively younger Jawoyn who do not have firsthand knowledge of the area either generally or specifically. These contrasting positions are highlighted by the legitimate concern of some Jawoyn about employment with BHP and those Jawoyn with direct custodial responsibility for sacred sites.

The NLC wrote again to Mr Hand in mid-February 1988, requesting that a final decision on the CZ boundary be delayed until the end of June 1988, to allow the NLC to develop a clearer Jawoyn position on the matter. Cabinet agreed to this request.

The Josif report

On 1 July 1988, the NLC forwarded the 'Josif Report' (Josif 1988) to Mr Hand. This report confirmed general Jawoyn opposition to any exploration or mining in the Gimbat area, since it was in the 'Sickness Country'. The report noted (p.(iii)) that the conflict of values between miners and Aborigines "has been apparent throughout the history of Jawoyn/European contact and persists today."

In explanation of the apparent diversity of Jawoyn opinion regarding exploration and mining at Coronation Hill (and presumably in respect the whole of the 'Sickness Country'), Josif proposed (p.(iii)):

The levels of knowledge about the 'Sickness Country' amongst the Jawoyn vary considerably. This has resulted in conflicts between senior Jawoyn and CHJV workers. Some other Jawoyn are, or have been, indifferent to developments on the CZ for a range of reasons. However, indifference is changing to concern about protecting the 'Sickness Country' as awareness of its significance increases, and Jawoyn elders and leaders take a more public position on "no mining in the 'Sickness Country'".

Another explanation is offered through an example described by Cooper (1989, p.5). He claimed that custodians, particularly when in stressful or embarrassing situations, give answers aimed at avoiding disagreement or controversy. This would explain why custodians apparently agreed to exploration at Coronation Hill when questioned by CHJV representatives but later signed a petition stating their opposition to it.

Josif claimed that the pressures associated with constant consultation and decision-making with respect to Coronation Hill had caused stress to the Jawoyn, which in turn had contributed to secondary health problems related to alcohol abuse. Further (p.(iv)):

Both traditional and non-traditional authority structures are being placed under pressure. Recent deaths and sicknesses among the Jawoyn have been attributed to disturbance of the 'Sickness Country' by the CHJV programme.

The report recommended the Government support the Jawoyn decision to have no mining in any form occur within the 'Sickness Country', and that an assessment of Aboriginal values (including archaeological, aesthetic and educational elements) be conducted so that a full inventory could be developed to ensure appropriate levels of protection.

The CHJV replies to the Josif report

In November 1988, the CHJV distributed 'A Reply to the Josif Report' which claimed (p.(i)) that its primary conclusions were "invalid and unsupported by available evidence." Further:

The concept of the 'Sickness Country' defined in August 1987 by David Cooper ... and endorsed by the Josif Report is not sustained by a detailed examination of past literature, a relevant land claim and discussions with people involved with the area for over 50 years, including Jawoyn custodians and tribal elders...(CHJV 1988, p.(i))

The CHJV's reply concluded, amongst other things, that:

- The Bula cult does not form the same integral part of the spiritual life of the present-day Jawoyn community as when it had been practised in the early 1940s
- A limited number of discrete, usually relatively small, secret/sacred Bula sites are known. The primary site is at Sleisbeck. These sites are significant merely because of their association with a previously practised cult
- Coronation Hill is not one of these sites and considerable doubt exists whether it has any special significance to the Jawoyn.
- Allegations in the Josif Report of adverse effects on the health and social fabric of the Jawoyn community caused by work in the 'Sickness Country' are completely unsupported. Opinions expressed by tribal elders suggest the contrary (CHJV 1988, p(i)).

The Senate weighs in with another report

In November 1988, the Senate Standing Committee on Environment, Recreation and the Arts presented its report on The Potential of the Kakadu National Park Region.

The Committee, in discussing exploration and mining in Kakadu National Park, presented both sides of the case, without making their own position clear. They did however appear to accept that mining activities were inconsistent with the definition of a national park, but at no stage recommended that exploration or mining should not occur in Kakadu National Park or the Conservation Zone. The main relevant recommendation the Committee made regarded withholding project approval in the CZ if it had potential to cause environmental damage within the catchment area of the South Alligator River. They also recommended that proposed projects be required to prepare a full rehabilitation plan before operations began.

Debate over the CHJV's EIS escalates

The CHJV released its Draft EIS for the Coronation Hill project in early December 1988. It was initially made available for public comment for 10 weeks, but this period was later extended to three months.

In its supplementary Final EIS completed in July 1989, the CHJV incorporated many of the comments received in response to the Draft EIS, responded to numerous criticisms and proposed some changes to operational aspects of the project. The complete EIS was submitted to the Commonwealth, seeking approval for Coronation Hill to proceed.

The Department of the Arts, Sport, the Environment, Tourism and Territories (DASETT) completed an Environmental Assessment Report of the Coronation Hill proposal in September 1989. DASETT concluded that the CHJV's environmental plan, with a number of incidental changes, if adhered to, would meet the standards required under the *Environment Protection (Impact of Proposals) Act 1974*. DASETT did, however, place two conditions on final approval; first, that the Minister for Aboriginal Affairs be informed that the project could have an adverse social impact upon the Jawoyn Aborigines and that the Minister's advice be sought on that impact; second, that further studies to assess the impact of the project on the ecology of the area be considered.

Sickness Country claim lodged under Commonwealth legislation

On 13 September 1989, the NLC applied for protection of the sacred sites complex around Coronation Hill and the 6 000 square kilometres of the 'Sickness Country' under the Commonwealth's Aboriginal and Torres Strait Islanders Heritage Protection Act 1984. The Jawoyn had previously applied to ASSPA to have the 'Sickness Country' registered as a sacred site under NT legislation. However, recent amendments to the Northern Territory Aboriginal Sacred Sites Act, allowing persons aggrieved by any decision by the ASSPA to appeal to the Minister (who can overrule the decision), may have caused the Jawoyn to lose confidence in the NT legislation, resulting in their appeal to Commonwealth authority.

Coronation Hill project appears to get government go-ahead

In their submission to this inquiry, the CHJV note (sub. 27, p.8):

In a letter of the 19 September [1989], the Minister for the Arts, Sport, the Environment, Tourism and Territories, Senator Graham Richardson, advised the Minister for Administrative Services, the Hon. Stewart West, that if Coronation Hill were a one-off development he would "not recommend against it" as a result of his Department's assessment of the EIS.

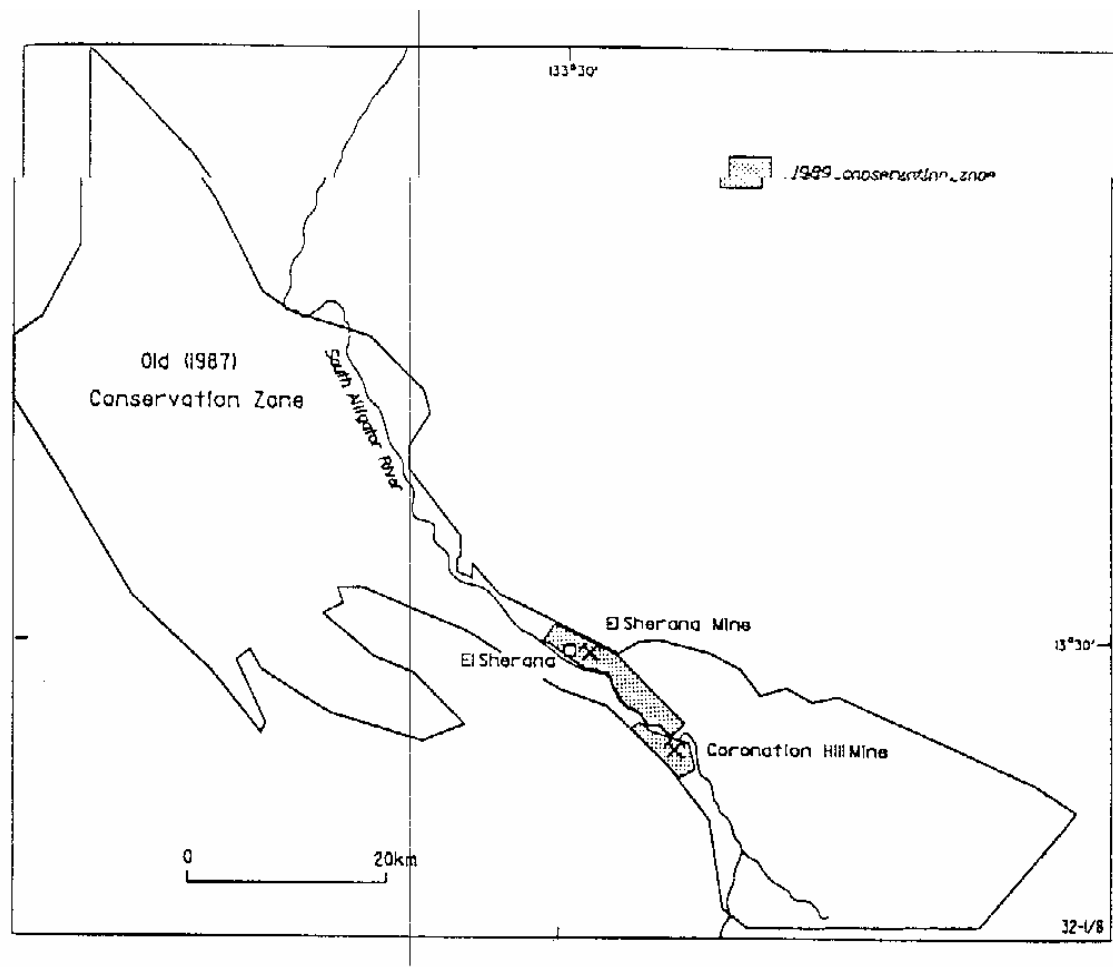
Conservation Zone is drastically reduced

Following two months of Cabinet debate on the boundaries of the CZ and consideration of CHJV's application to mine Coronation Hill, the Prime Minister released a media statement on 5 October 1989 announcing the Government's decision to reduce the CZ to something like 2 per cent of its gazetted size - namely, the 47 square kilometre strip of mineral leases bounded by Coronation Hill and El Sherana (refer Figure 21.3). The other 98 per cent of the old CZ would be included in Kakadu National Park.

The Government explained this decision (Media statement 1989, p.1) in the following terms:

Because of the very great importance Australians properly attach to Kakadu and the greatly increasing value of the area in terms of tourism, the Government has decided that it could not responsibly err on the side of risk to the Kakadu wetlands fed from the catchment area. Our international obligations arising from the World Heritage listing underline the need for our position to be one of maximum care and protection, rather than taking chances.

Figure 21.3: Revised Conservation Zone boundary



Source: BMR

Government moves to set up inquiries

The statement foreshadowed two inquiries. The first inquiry resulted from the NLC's request, on behalf of the Jawoyn, for the 'Sickness Country' to be protected under the Commonwealth's *Aboriginal and Torres Strait Islanders Heritage Protection Act 1984*. Under this Act, the Minister for Aboriginal Affairs has the power to appoint a person to prepare a report in anticipation of the possibility that a certificate will be issued under the Sacred Sites Act allowing disturbance of the land. Should the ASSPA or the NT Minister for Lands approve an application for exploration or mining in the 'Sickness Country', the Commonwealth Minister for Aboriginal Affairs would then have to confirm or reject that decision. To avoid possible further delays if that situation should arise, the Government has decided to hold an inquiry to provide the Minister with information necessary to make such a decision.

The second of these inquiries is to address economic and environmental aspects. The Prime Minister made a statement (Media statement 1989, p.2) explaining that:

The Government has received an Environmental Impact Study on Coronation Hill. If this were the only relevant consideration, the Government could be expected to take a decision at this point as to mining, subject only to proper processes regarding Aboriginal claims.

But this is not the case. There is a series of leases along the South Alligator River extending from Coronation Hill to El Sherana.

The Coronation Hill mine and the nearby El Sherana deposit would have their ores processed at a single treatment plant close to Coronation Hill. Consequently, El Sherana and Coronation Hill, taken together, or in conjunction with development of other leases between the two, could well have a size and complexity of operation which would have a total impact representing an unacceptable hazard to the wetlands of the existing World Heritage area. Any development of El Sherana would mean significant modification and expansion at Coronation Hill including extra processing, storage and tailings facilities.

Moreover, even if they were separate operations the cumulative risk they pose to the Park might be judged as excessive.

The El Sherana mineral deposit might prove to be far richer than the one at Coronation Hill. Approval now for Coronation Hill therefore could prejudice the possible development of a potentially richer ore body at El Sherana were the Government later to judge that the risk could only justify one mine.

Therefore the Government has decided that over and above the EIS covering only Coronation Hill, it needs a single coherent assessment of the economic and environmental considerations relating to this strip along the river.

The Government asked the newly established Resource Assessment Commission (RAC) to conduct an inquiry into the environmental values of the new CZ, together with the impact that possible

mining operations would have on these values and on the values of Kakadu National Park. The RAC has also been asked to determine the national economic significance of possible mining developments in the area. The Government expects a report by April 1991.

Government's decisions provoke strong responses

The decision provoked some strong responses, including the following commentary from the Australian Financial Review (Gill 1989):

The Cabinet's Kakadu decision was based on the illusion and myth perpetrated by the conservation movement and the perceived need for the Government to pander to the 'green' vote. ... Despite misgivings by a number of ministers, Cabinet opted for political expediency rather than a well-balanced, tough decision of the type that has previously given the Hawke Government credibility as good economic managers. ... The Kakadu decision is an ideological hand-out to the conservation movement in return for shoring up the green vote at the next election.

Cabinet had been divided over the CZ issue until the Prime Minister, Mr Hawke, made it clear he preferred the option to greatly reduce the CZ, prompting a press report (Kitney 1989) that described the decision by claiming "Mr Hawke has steamrolled the Cabinet."

The new and greatly reduced CZ along with revised Stage III boundaries were proclaimed in November 1989.

Exploration and mining activity in the CZ is now on hold pending the outcome of the RAC inquiry.

21.3 Should the Coronation Hill mine have been allowed to proceed?

The CHJV met the environmental requirements for the proposed mine as set out at the time by the Government. DASETT (the designated authority) effectively cleared the Coronation Hill EIS, declaring it was satisfied the mine could proceed without serious risk to the environment. The Office of the Supervising Scientist for the Alligator Rivers Region agreed (the Coronation Hill proposal crucially included a no release water management system).

The CHJV submitted that they have incurred significant costs associated with delaying the project which, under normal circumstances, would have proceeded in June 1989. These costs include over \$80 million in forgone revenue for the financial years 1989-90 and 1990-91 (\$64m of which would not have been assessable under the new gold tax), some \$4 million in interest on exploration expenditure and \$1 million in ongoing costs.

The Government explained its decision by pointing to the likelihood of other mines in the CZ becoming established, and therefore the possibility that their cumulative impact could pose an unacceptable risk to the wetlands of Kakadu National Park.

The CHJV was assured a number of times by the Government that Coronation Hill would be allowed to proceed, providing it met environmental, Aboriginal, heritage and related requirements.

In 1986, the Federal Government recommended that CHJV prepare an Environmental Impact Statement under the *Environment Protection (Impact of Proposals) Act*. Discussions were held in 1987 to clarify the guidelines that CHJV were to address in the EIS. In their submission, the CHJV noted (sub. 27, p.12):

The guidelines were finalized by the Federal Government and issued to the CHJV by DASETT in June 1987. They were comprehensive and detailed the information required for the Government to make a decision on the Project. The guidelines were clearly centred on the Project and this was reinforced by directions from DASETT that CHJV concentrate on Coronation Hill and not introduce other issues into the EIS (such as exploration of other CHJV tenements). It therefore came as a complete surprise to the CHJV that ... there were concerns about the possible cumulative effects of other potential developments in the area on the values of Kakadu National Park.

Economic Significance of the project

The CHJV can point to the potential benefits of the project to the economy as a whole (and the NT economy in particular) in terms of employment opportunities (including jobs for Aborigines), and development of the local economy generally - associated with the value of the minerals which would be mined (principally gold, but also platinum and palladium). The CHJV estimated (Dames and Moore 1988, p.1-7) that "Total income generated, including multiplier effects in the form of salaries and wages, will be approximately \$13 million per year for the Northern Territory". Having stated that Australia imports the majority of its platinum and palladium, and that world supply of these metals is dominated by South Africa and the Soviet Union, the CHJV also claimed (Dames and Moore 1988, p.1-9) that "... the strategic importance of the Project is illustrated by the fact that the peak production rates of platinum and palladium will be double the current [1988] Australian refinery production of those metals."

There may also be opportunities for sizeable royalties flowing to the community, although cumulative delays to the project will have dissipated much of any available rents (see 'Dissipation of mineral rent' in section 14.1 of this Volume).

Nevertheless, apart from Aboriginal concerns, the project passed the normal tests in place at the time it was proposed and would have presumably gone ahead if special circumstances had not persuaded the Commonwealth government to intervene.

Aboriginal concerns

Coronation Hill lies within the 'upper South Alligator Bula complex' - a registered sacred site covering 260 square kilometres. Only part of the project area is affected, but that part includes the mine site itself. The whole project area also lies within the 'Sickness Country' - a sacred site claim of some 6 000 square kilometres that has yet to be determined. The traditional owners (the Jawoyn) have requested protection of the 'Sickness Country' under NT legislation by the ASSPA and also under Commonwealth heritage legislation. This means Coronation Hill could eventually be protected by three sacred site claims - so that if the CHJV received Government environmental clearance, the joint venturers could be required to obtain appropriate clearances under all three claims before proceeding. All three claims would depend upon the wishes of the relevant Aboriginal traditional owners - the Jawoyn.

The Jawoyn had agreed to exploration at Coronation Hill, but later withdrew their permission, and a majority currently appear opposed to mining - at least that seems to be the decision of the Jawoyn Association (see minutes of a recent meeting in Volume 4 - *Who speaks for the Jawoyn*). However, the Commission was also given a petition organised by Andy Andrews (reproduced in Volume 4 - *Who speaks for the Jawoyn*, and which contains a number of names of people who were also present when the Association made its decision) to the effect that mining of Coronation Hill should be allowed to proceed. (This raises the confusing question of who exactly speaks for the Jawoyn people? - see the discussion on this subject, also in Volume 4 - *Who speaks for the Jawoyn*.)

However, as circumstances stand at the moment, the Jawoyn may have no say in what happens at Coronation Hill, since the NT Government can over-ride the sacred-site status of Guratba under its legislation. It is against this possibility that an identical claim has been lodged on behalf of the Jawoyn under Commonwealth legislation.

Sovereign risk aspects of the decision

The mining industry is already wary of what it sees as arbitrary and ad hoc changes in Government policy which adversely affect mining projects. This 'sovereign risk' problem acts as a disincentive to undertaking exploration, without which there would no longer be an industry once existing projects reach the end of their economic lives. If the Government does not, finally, allow Coronation Hill to proceed after repeatedly assuring the CHJV that it would, that outcome would be seen as the latest - and in many ways the most spectacular (given the publicity the project has attracted) - evidence of the reality of sovereign risk problems in Australia.

21.4 Was the decision to drastically reduce the Conservation Zone the right one?

If Coronation Hill provides a highly localised example of how not to go about resolving land-use problems in the face of apparently irreconcilable differences in the wishes of opposing groups, the CZ decision provides a similar example on a much grander scale.

Rather than first ascertaining the potential value of the minerals that would be alienated once the land was incorporated in Kakadu National Park - so that an informed decision could have been made - the Government chose instead to press ahead. This decision has effectively meant that the Australian (but more particularly the NT) community was denied the opportunity to make a rational decision, based on consideration of the relative costs and benefits of alternative courses of action. And it need not necessarily have been an either/or situation, since mining is a temporary land use.

Certainly environmental concerns would (and should) have loomed large in such a decision, given the important environmental values protected by Stage I of the park. But society is constantly making decisions in situations where there is a small probability that potentially disastrous consequences might ensue (eg only building single lane roads when dual carriageways would lead to fewer road deaths).

21.5 Conclusions

The Coronation Hill experience graphically illustrates the need for a better system for making land use decisions - one which not only permits necessary data to be gathered prior to making a decision, but also sets out a proper cost-benefit framework within which information on such things as mineral prospectivity and environmental values can (as far as possible) be brought to common account. Then if mining is contemplated, that decision-making process should provide the guidelines (eg covering issues such as expectations about environmental performance - perhaps in some cases backed up by bonds redeemable on satisfactory compliance) which potential miners need to know in advance if they are to make their own evaluations of whether or not to proceed. If the public was provided with more accurate and transparent information, it would remove the incentive for politically expedient decisions and would significantly reduce the sovereign risk factor.

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22 THE COAL INDUSTRY

The coal industry is subject to a substantial amount of Commonwealth and State Government intervention - some of which is unique to the industry and much more stringent than in other Australian industry, in terms of the detail to which even day-to-day operations are monitored and regulated. Government agencies oversight/regulate almost all aspects of coal mining operations, including occupational health and safety, workers compensation arrangements, production decisions (including even whether or not mines can open or close down), industrial relations, marketing, and research and development. Many of the regulations were introduced progressively over a considerable period in response to particular circumstances or events. However, changed conditions have in many cases weakened or totally negated the original arguments for government intervention. In the face of highly competitive international coal markets, retention of inappropriate regulations is impeding the efficiency and economic performance of the industry. The Commission is convinced that there are substantial gains available from reducing the level of intervention in an industry that is Australia's best export performer and largest earner of foreign exchange.

22.1 Introduction

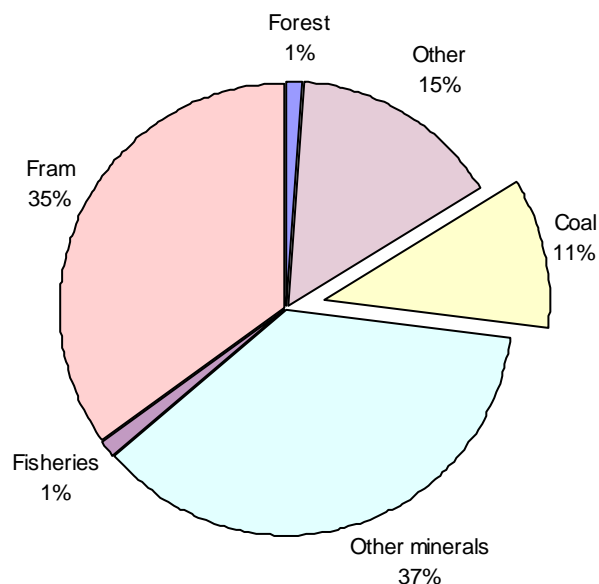
The coal industry has been and is still perceived by some to be "special" for various reasons including: the dangerous nature of work; the fact that the industry is such a large export earner; the relatively long history of the coal industry both in this country and more particularly overseas; conflicts between management and labour (including the case of children down coal mines); the close proximity of some coal mines to (or under) urban areas; and special safety concerns (eg gases not present in other mines).

For these and other reasons, governments have intervened in the coal industry more than most - with the result that oversight and detailed regulation of coal mining projects is largely unparalleled in other Australian industries. This section questions whether coal is so special and the continuing relevance of much of present government intervention in the industry.

22.2 Industry profile

Black coal is Australia's major export commodity, with coal, coke and briquettes accounting for approximately 11 per cent of the total value of merchandise exports in 1988-89 (see Figure 22.1). Also the black coal industry is of vital importance to the Australian economy since it is the energy source for 57 per cent of Australia's electricity production and is an essential material for the steel, alumina, cement and paper industries (Joint Australian Coal Industry Working Party 1989).

Figure 22.1: The Percentage of Australian merchandise exports (value) accounted for by coal^a 1988-89



a Coal, coke and briquettes.

Source: ABARE 1989a, Commodity Statistical Bulletin.

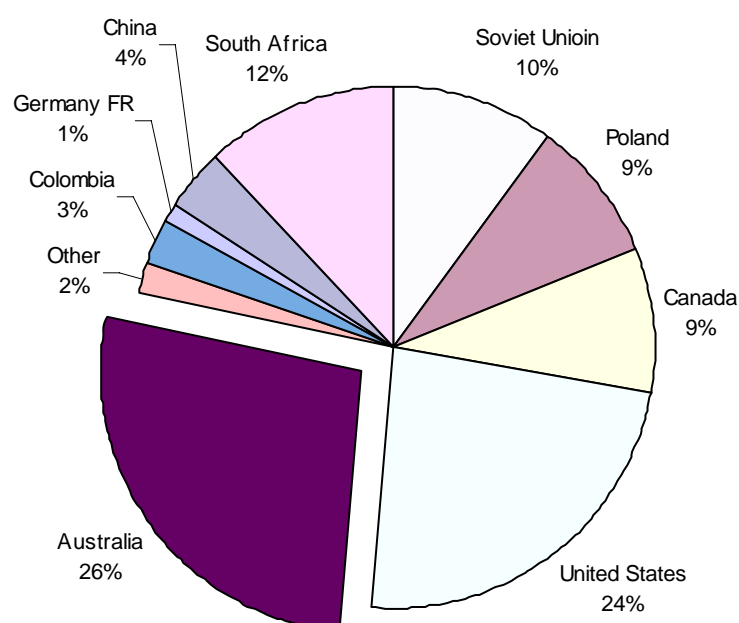
Australian coal deposits are among the best in the world in terms of quality, variety, and flexibility in end use. Australia has extensive resources of both coking and steaming coal which are generally located close to the surface and near the coast. The demonstrated economic reserves of black coal in Australia are 71 200 million tonnes (in-situ) resources and 50 800 million tonnes (recoverable) resources (BMR 1990). Virtually all of Australia's largest, and most economically significant resources of black coal are concentrated in New South Wales and Queensland. In 1988-89, raw coal production in these States was 81.3 million tonnes and 95.5 million tonnes respectively, together accounting for about 76 per cent of total Australian production (ABARE 1989a, p.198).

The black coal industry in NSW and Queensland comprised over one hundred mines in 1988-89 (68 in NSW and 38 in Queensland). The NSW industry is dominated by underground mines, which account for 60 per cent of production. In Queensland underground mines account for only 5 per cent of production. Queensland mines are, on average, larger than NSW mines: the ten largest mines account for 64 per cent of Queensland production, compared with only 39 per cent in NSW.(ACA, sub. 71, p.7)

The strong growth experienced by the industry is evidenced by exports of 99.3 million tonnes in 88-89, compared with 47.4 million tonnes in 1980-81 and 1.9 million tonnes in 1960-61 (ABARE 1989a, p.197). Australia has been the world's largest coal exporter since 1984, when it surpassed

the USA. It currently accounts for around 27 per cent of world exports (see Figure 22.2). On the other hand, Australia's total production of coal is modest by world standards: as Figure 22.3 shows, Australia accounted for only 4 per cent of total world production in 1988. As a result of its comparatively small domestic sales compared with other major coal producers, the Australian coal industry is heavily export oriented - with approximately 70 per cent of total production destined for overseas markets. Thus, the Australian industry is particularly sensitive to the vagaries of the world economy - underscoring a need to achieve and maintain flexibility so that it can adapt quickly to changing market conditions.

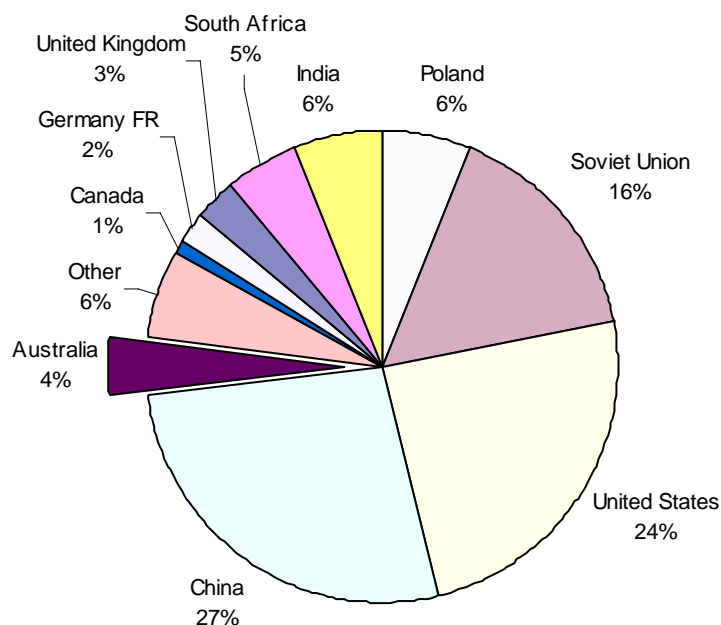
Figure 22.2: World exports of coal (coking and steaming) 1988^a



^a Australian figures are preliminary figures.

Source: ABARE 1989a, Commodity Statistical Bulletin

Figure 22.3: World hard coal production^a



^a Australian figures are preliminary figures.

Source: ABARE 1989a, Commodity Statistical Bulletin

The Australian coal industry is technologically advanced, capital intensive and highly mechanised. The workforce skills, in many instances, are comparable to those used in many other Australian industries and, in fact, are not much different from those required in other mining activities where specific institutional arrangements do not exist.

The coal industry is currently recovering from a critical period in its development, characterised by international over-supply, depressed prices, mine closures, retrenchments and significant losses by many companies. With an expected expansion in world coal trade in the 1990s, the Australian industry has the potential to increase significantly its export performance. According to a recent ABARE projection, the value of Australian coal exports could exceed nine billion dollars by the year 2000 (ABARE 1989a, p.9). With other countries poised to supply, whether our coal industry can realise this potential will depend importantly on establishing a reputation for reliability and remaining cost-competitive on world markets, as well as bringing on stream substantial increases in capacity. Another important determinant of how well the industry performs in the 1990s will be the role played by governments, in particular whether governments at all levels in Australia adopt a less intrusive regulatory framework which encourages the industry to become more efficient, while at the same time satisfying society's legitimate concerns about environmental aspects of coal mining.

22.3 Government intervention in the industry

Joint Coal Board (JCB)

The JCB was established under parallel legislation passed by the Commonwealth and NSW Governments in 1946. Its main purpose was described in the preamble to the Acts as:

... to provide means for securing and maintaining supplies of coal throughout Australia and for providing for the regulation and improvement of the coal industry in the State of New South Wales.

At the time of the JCB's establishment, coal mining 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 was given extensive powers to secure the short- and longer-term stability of the industry, with its immediate task to reorganise and re-equip mines to produce sufficient coal to meet Australia's requirements for industry and the railway systems. (Coal was the main energy source at the time.)

The statutory obligations and powers of the JCB pursuant to the Coal Industry Acts are extensive, although many of the powers are not currently exercised. Both Acts contain sections declaring the general functions and powers of the JCB, as follows:

- to ensure that coal is produced in the State in such quantities and with such regularity as will meet requirements throughout Australia and in trade with other countries;
- to ensure that the coal resources of the State are conserved, developed, worked and used to the best advantage in the public interest;
- to ensure that coal produced in the State is distributed and used in such manner, quantities, classes and grades and at such prices as are calculated best to serve the public interest and secure the economical use of coal and the maintenance of essential services and industrial activities; and
- to promote the welfare of workers engaged in the coal industry in the State.

The JCB exercises its extensive powers by making Orders or giving Directions. Failure to obey them is an offence (see s.54). Since 1946, the JCB has made 40 Orders, ten of which remain in force. These are:

- Order No 5 - Dec 1947 - Weekly Coal Consumption Return
- Order No 10 - Sep 1948 - Workers Compensation Insurance
- Order No 27 - Feb 1971 - Consent to Open Mine or Produce Coal
- Order No 29 - Dec 1973 - Limitations on Production
- Order No 34 - Oct 1979 - Training of Mineworkers
- Order No 35 - Aug 1980 - Conditions of Employment of JCB Officers
- Order No 36 - Jun 1983 - Fortnightly Coal Mining Returns
- Order No 37 - Dec 1984 - Coal Export Contract Details
- Order No 39 - Dec 1985 - Reverse Flush Strainers
- Order No 40 - Jul 1990 - Coal Dust on Longwall Faces

The funds which enable the JCB to discharge its statutory functions mainly come from: annual parliamentary (Commonwealth and NSW) appropriations; insurance premiums payable under its workers compensation scheme; investment of the JCB's accumulated funds and reserves; and fees received for technical services provided to the coal industry (JCB 1988, p.7).

The JCB is a body corporate with perpetual succession. It has a common seal and the Acts provide for a Chairman and two other members each of whom is appointed for a period not exceeding seven years and is eligible for re-appointment. Currently, the JCB employs approximately 240 people.

An independent review of the JCB is due for completion by the end of February 1991. Established by the Commonwealth and NSW Governments, the review is examining the powers, functions and activities of the Board. The objective of the review is:

to promote the most efficient and effective infrastructure of industry support, regulations and mineworkers' welfare to ensure the continued place of the NSW coal industry in the domestic and international trade.(Minister for Primary Industries and Energy 1990)

Queensland Coal Board (QCB)

The QCB has a similar role in Queensland to that of the JCB in NSW, although it has a far lower profile. The QCB was established in 1948 under the Queensland Coal Industry Control Act in response to the disruption of domestic coal production during World War II and in the immediate post-war years. Unlike the JCB, however, the QCB is not a joint creation of the Commonwealth and State Governments. Its governing Act is solely Queensland legislation. The QCB is administered through the portfolio of the Minister of Mines and Energy. The present QCB comprises a Chairman and two members and employs 14 full time officers. Its income is derived from contributions by coal mining companies, grants from consolidated revenue and interest earnings (QCB 1989, p.4).

The QCB has extensive powers over the mining and sale of coal within Queensland. It has the power to intervene in the opening and closing of coal mines, although at present it does not appear to exercise this power. The QCB can control the price of coal sold within Queensland. The QCB also has power to control the stockpiling of coal and may require users to provide and maintain a stockpile of coal of a specified quantity and quality. In addition, it has the power to take control of a mine and acquire land, coal and equipment to operate it, if it considers such action is necessary to maintain or increase coal production.

The QCB's activities include administration of the Coal Miners Health Scheme (involving medical examination of new workers), the Colliery Employees Severance Pay Fund, grants and loans for welfare projects, coal marketing, coal sampling and determination of prices for some local coal sales (QCB 1989, p.4).

The Queensland Government has recently announced its intention to expand the QCB (Minister Ken Vaughan 1990). "The revamped Board [QCB] will be responsible for providing long-range planning and policy advice as well as ensuring that Government policy on the industry is implemented."

Coal Mines Regulation Act

The NSW Coal Mines Regulation Act 1982 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. It also takes into account the effect of underground mining on the surface of the land. Responsibility for administration of the Act lies with the Department of Minerals and Energy. The legislation empowers inspectors to conduct regular inspections of underground and open-cut coal mines and coal preparation plants to ensure compliance with the Act and its Regulations, as well as to conduct investigations into accidents and near accidents.

Coal Industry Tribunal (CIT)

Industrial relations in the coal mining industry are handled by the CIT and subsidiary Local Coal Authorities (LCAs). The establishment of the CIT came at a time when the coal industry was NSW-based and was producing largely for the domestic market. This was a period in which unstable industrial relations threatened to adversely affect postwar recovery and intensify the wartime coal shortage. It was in this context that the Commonwealth Government repealed the Coal Production (Wartime) Act and introduced the Coal Industry Act, 1946. An almost identical Act was introduced into the NSW Parliament, with Commonwealth agreement, and is also known as the *Coal Industry Act, 1946*. These Acts established the CIT and the LCAs (in addition to the JCB). By virtue of the Commonwealth Act, the CIT's jurisdiction extends to the coal mining industry in Queensland and Tasmania, although LCAs are restricted to NSW. Local industrial disputes within Queensland are settled by a Board of Reference created under the awards of the CIT.

The Coal Industry Acts give the CIT the power to consider and determine industrial disputes, industrial matters arising under an award or order of the CIT relating to the coal industry in NSW, and any matter affecting interstate industrial relations in the industry. The LCAs and the Board of Reference both deal with local matters, with an avenue of appeal to the CIT. When a local dispute takes on a character which has implications for the whole industry, it is dealt with by the CIT. The CIT consists of a single member who has the legislative power to resolve interstate and NSW industrial disputes. Once a decision has been made by the CIT, there is no provision for appeal, except on jurisdictional grounds where the civil courts would be involved.

Western Australian Coal Industry Tribunal

Industrial relation in the Western Australian coal industry are regulated by the Western Australian Coal Industry Tribunal (WA CIT). The WA CIT was established in 1948 under the *Western Australian Mining Act Amendment Act 1948*. The legislation governing the operations of the WA CIT came under this Act until 1978 when a separate Act was established called the *Western Australian Coal Industry Tribunal Act 1978*. The Commission understands that an amendment bill is to be considered at the Autumn 1991 sitting of Parliament with the objective being to update it.

The 1978 Act gives the WA CIT the power to consider and determine any industrial dispute, industrial matter or other matter relating to the coal mining industry in the state. Local industrial disputes within WA are settled by a Board of Reference, which is located in the Collie area. The WA CIT consists of five members which include the Chairman, two people from the Union¹ representing employees, and two employer representatives.

The Coal Mining Industry Labour Adjustment Package

This package was introduced in 1987-88 to help retrenched coal miners in the New South Wales and Queensland coal mines as part of the restructuring and adjustment that was occurring in the industry. Funding was provided for special re-employment, retraining and relocation assistance. In 1987-88 the Commonwealth Government approved \$8 million to be spent over the three-year life of this program. This package is now been woundup, pending the completion of training by participants (DEET 1990).

Coal Mining Industry Long Service Leave Fund

The Commonwealth Government levies an excise of \$0.25 per tonne on all black coal sold. This excise comprises a payment of \$0.20 per tonne for employees long service leave and \$0.05 to fund coal research and development (see below). The Commonwealth Department of Industrial Relations administers the Fund, established under the *States Grants (Coal Mining Industry Long Service Leave) Act 1949*, with complementary legislation in New South Wales, Queensland, Western Australia and Tasmania. This arrangement is designed to give coal miners mobility in the industry without loss of long service leave entitlements (DIR 1989).

Australian Coal Marketing and Technology Council (ACMTC)

The ACMTC was established in August 1988 to provide advice on coal marketing strategies (and other means of improving Australia's marketing performance) and on technology matters to the Minister for Primary Industries and Energy. The Council was intended to be a key element of the Commonwealth Government's decision to strengthen the administration of export controls (Minister for Primary Industries and Energy 1988). The Council's charter is to advise on measures designed to enhance Australia's export trade in coal. In fulfilling its role the Council is required to:

- recognise the importance for the national economy of a commercially viable and competitive Australian coal industry and the Government's commitment to obtaining a fair return for Australia's exports;
- provide advice based upon sound marketing principles and the realities of current conditions, constraints and developments in international coal markets; and
- have regard to the Government's export control policy on coal.

¹ "Union" means the union of which the majority of the workers concerned in an industrial dispute or industrial matter are members.

The Council has both industry and union representation. In 1989-90 the Council met five times "and principal matters on which recommendations were made to the Minister included coal trade promotion and coal marketing strategy" (DPIE 1990, p.194).

Research and Development Levy

In 1978, the Commonwealth Government formed the Coal Research Trust Account (CRTA) into which a levy on saleable coal production of 5 cents per tonne is paid by coal mining companies. The levy currently generates about \$7.5 million annually. This levy was imposed to boost Australia's energy research effort by supplementing and co-ordinating existing research; with the specific objective of "develop[ing] the technological capacity to make the fullest possible economic use of [Australia's] very considerable coal reserves in meeting future requirements" (Commonwealth Record 1977, pp.1066-1067). The National Energy Research, Development and Demonstration Council (NERDDC) was established to administer CRTA funds plus monies appropriated from Consolidated Revenue through the Energy Research Trust Account (ERTA). The NERDDC program is administered by DPIE.

Applications for support grants from CRTA funds are assessed by NERDDC's Technical Standing Committees. Projects are recommended to the Minister by the NERDDC Board of Management on the basis of the Committees' recommendations and the Council's overall funding capacity. In 1989-90, some 45 coal-related research and development projects costing approximately \$11.5 million were approved (NERDDC 1990).

Australian Coal Industry Council

This Council was established in 1990 to replace the Australian Coal Consultative Council (ACCC) which last met in 1987. It is a forum for consultation on all matters of coal industry policy. Its members are the Minister for Primary Industries and Energy, the Queensland and New South Wales Ministers for Minerals and Energy, the Chairman of the New South Wales and Queensland Coal Associations, the President of the UMFA, and the General Secretary of the Federated Engine Drivers' and Firemen's Association.

Following the Council's first meeting its Chairman, Mr John Kerin, stated that the Council would be "a peak forum for information exchange between key players in the industry". He believed the ACIC "may lead to a better understanding of differing viewpoints and perhaps the emergence of a common approach to key issues ... ACIC should encourage thinking about longer-term trends in the industry and appropriate policy responses, as well as helping to resolve immediate issues." (Minister for Primary Industries and Energy 1990)

Export controls and duties

The Commonwealth Government has the power to intervene in commercial negotiations relating to mineral exports if it believes such intervention to be "in the national interest". Coal is one such mineral since exporters must obtain export approval on completion of contract negotiations (See detail in Section 10).

The Commonwealth Government also has the power to impose export duties and currently does so in respect of high-quality steaming coal (See detail in Section 10).

22.4 Is government intervention in the coal industry justified?

The appropriateness of the wide-ranging regulation of the coal industry is discussed below, grouped into: regulation of coal operations; the industrial relations framework; interventions in coal marketing; government involvement in research and development; and finally the more general question of whether the JCB and the QCB should continue to exist.

Regulation of coal mining operations

Regulations controlling the day-to-day operations of coal mines include: JCB Orders 27 and 29 which govern commercial decisions relating to new coal mines (and closures), substantial mine developments, and production levels; worker's compensation arrangements; statistical returns; and health and safety regulations.

Commercial decisions

Commercial decisions in respect of mine operations are subject to various JCB orders. For example, the objective of ensuring economic viability, optimum development and utilisation of resources, and technical efficiency in resource use is pursued inter alia through Orders No. 27 and No. 29. Order No. 27 requires the JCB's approval before mines are opened, closed or before any major development work is undertaken. The objective of this order "is to provide the Board with sufficient information to clearly show that the proposed project is technically, economically and environmentally sound, that the applicant has the technical and financial resources to efficiently develop a modern mine". That is, to "ensure the optimum development and utilisation of the State's coal reserves". (JCB, sub. 18, p.27) A copy of Order No. 27 and the associated guidelines and information required for approval is found in Volume 4, Section 7. The Board's consent to an Order No. 27 application may be given subject to conditions which are specified by the Board. Where conditions or requirements have been specified, they usually relate to coal production levels. Order No. 29 empowers the Board to impose limits on coal mine production and dispatches. A copy of this order is also found in Volume 4, Section 7.

The United Mineworkers Federation of Australia submitted (sub. 129, p.5) that Order No. 27 was the only instrument available in Australia which can be used deliberately to rationalise the development of new mines or capacity in the coal mining industry. The UMFA supported this instrument by pointing towards the dangers of excess capacity build-up, arguing that at present:

There is a danger that the current strength of the coal markets and a flood of forecasts of increased demand over the next decade is encouraging an excessive and unplanned rush of capital into expansion of coal mining capacity. This potential arises now as in the past because investment decisions are ultimately made by individual companies looking at a growth in demand rather than an industry measuring its productive capacity against expected demand.

The UMFA drew (sub. 129, p.6) the Commission's attention to the Ensham development in Queensland which it contended provided an example of a project which demonstrated the inability of companies to arrive at a clear decision on market prospects and whether mines should be opened or expanded.(See Box 22.1)

Box 22.1: The Ensham development

The following is an account of the Ensham Development as perceived by the UMFA. In May 1990, "the joint venture partners (CRA, Agip, Idemitsu and Lucky Goldstar) could not agree on whether to develop the [Ensham] deposit immediately or not. Idemitsu and Lucky Goldstar were in favour of development while CRA and Agip were uncertain of whether any firm market existed to sustain the development financially. The Queensland Government reasoned that as there have been no mine openings in Queensland since the early 1980's, CRA and Agip should be excluded from the project to give Idemitsu and Luck Goldstar the opportunity to press ahead. The Financial Times' respected International Coal Report (number 248, 18/5/90, page 7) reported that "at current steam coal prices and without firm long term contracts, the project simply doesn't stack up". It also reported that the conflict in market assessments and intentions at Ensham also existed in many other prospective projects, and that the Ensham decision may spur other companies to accelerate development decisions unnecessarily. The Brisbane Courier Mail reported on 17 May 1990 that the Queensland Coal Association had concerns about opening a new mine when prices were softening and customer stockpiles were rising."(UMFA, sub. 129, p.6)

According to the JCB (sub. 18, p.30) at March 1990, 17 of the 68 coal mines in NSW were operating under maximum production levels specified by the Board under Orders Nos. 27 and 29. The JCB submitted that most of the mines subject to maximum permissible production levels are open-cut mines producing for the export market since these mines are generally capable of implementing large incremental production increases within a relatively short time span.

The New South Wales Coal Association argued that Orders Nos. 27 and 29 established pervasive and intrusive controls over the commercial activities of coal miners (NSWCA 1990, p.15). It stated that:

There is no capacity for anyone aggrieved by the inter-locking operation of these Orders to appeal. Any review by the courts would be under the limited operation of the Administrative Decision (Judicial Review) Act, in these cases doubly limited because the Board derives its powers under State as well as Commonwealth constitutions; and only the Commonwealth aspects of the powers would be reviewable.

The Association believed (NSWCA 1990, p.34) Orders Nos. 27 and 29 confirmed the Board's "command and control" approach to its mission. "They collect unnecessary information, introduce great uncertainties for planning and management, create inequities that ought to be compensated for and, while purporting to protect the public interest, duplicate the regulatory functions of the relevant State Government agencies and detract from their accountability. Subsequently, they maintained that these Orders were inappropriate and should be rescinded.(NSWCA 1990, p.34)

The Association submitted that the main issue in relation to Order No.27 was the "intrusiveness" of the whole process, since the Board insists on being privy to every commercial detail, an approach unknown in other industries.(NSWCA 1990, p.23)

In relation to Order No 29 the Association was opposed to the fact that the Board can "specify" the production limits of individual coal enterprises. "Absolutely no principles are laid down in the Order showing how the Board will make these specifications, still less in the Act itself. Thus this important exercise of discretion is open to no scrutiny whatever."(p.16)

KCC submitted (sub. 87, p.5) that it is no longer appropriate that the JCB should possess the power to open or to expand a coal mine. The Commission's attention was drawn to KCC's attempt to close the Coal Cliff mine in 1984 (See Box 24.2), which it believed should have been closed but was prevented from doing so by "bureaucratic and ultimately political intervention"(KCC sub. 87, p.5).

Box 22.2: The attempted closure of Coal Cliff Mine

In 1984, in the face of depressed demand, low productivity and substantial losses KCC made a management decision to close its Coal Cliff Mine. As required under order 27, KCC sought approval from the NSW Department of Mineral Resources and from the JCB. The Minister for Minerals, Resources and Energy and the JCB appointed chartered accountants to examine the financial position of the company so as to evaluate KCC's decision to close the mine. As a result of this intervention, KCC was directed to keep the mine open.

KCC contended that the decision to not allow KCC to close down operations was incorrect since the examination was taken on an overall basis, when KCC "was concerned with the operations of one mine within [their] organisation as normal prudent business policy would dictate and [they] in fact brought in [their] own chartered accountants to contradict the view that those people found."

KCC indicated that the closure of the mine did not inhibit or exclude the future reopening of this mine. According to KCC the decision to prevent the mine's closure resulted in a loss situation for the last 4 to 5 years.

Source: Transcript, pp.1789-1797

Participants also highlighted the duplication of the Board's powers and those under the *Coal Mining Act*. For example, Oakbridge contended (sub. 32, p.31) that the JCB's involvement in commercial activities was already "pursued by the Coal Mining Act's administrators, who are clearly responsible for making relevant decisions in these areas. The JCB's involvement is entirely redundant, duplicating compliance costs and compounding uncertainties" (Oakbridge, sub. 32, p.31).

Oakbridge commented (sub. 32, p.32) on the incidence of the Board's production controls on open-cut rather than underground mines. It accepted this policy may have helped to ease local and regional disruption in an industrial sense, although it added that it has impeded the pace of restructuring, not avoided it, and served to ensure that suppliers outside NSW were positioned earlier to take advantage of market opportunities.

Volume 4, Section 7 contains a copy of Orders Nos. 27 and 29, plus associated guidelines or information required for approval. Order No. 27 contains eight appendices detailing the type of information required just to submit an application. This ranges from information outlining the geology of the site to financial information relating to capital expenditure and break-even analysis. As expressed by the NSWCA (NSWCA 1990, p.23) "the detail of the technical and marketing information sought is simply bewildering". In addition, the Order warns the applicant that applications "can take up to 3 months to process."

The Commission considers that the extent of information required and delays involved in processing an application are excessive, imposing unnecessary compliance costs on the applicant and compounding uncertainties already inherent in a commercial decision.

Order No. 29 may not involve the excessive compliance costs experienced with Order No. 27, although the Commission believes it is an unnecessary degree of regulation which is effectively constraining coal producers from using their own commercial judgement in relation to the level of production the firm wishes to undertake.

The Commission concludes that both Order No. 27 and No. 29 are examples of regulations or functions of the Board which are unjustified, costly, duplicative and hence redundant in the modern coal industry.

Workers compensation

The NSW coal industry has a separate and compulsory² industry-wide workers compensation scheme which is provided for under the NSW Workers' Compensation Act 1946³. This Act has special benefit provisions within it that relate specifically to the coal industry. This scheme is administered by the JCB since the Board is a registered insurer under the Act. The operations of the scheme are conducted through the workers' compensation fund, one of the statutory funds which the Board is required by the Coal Industry Acts to keep. Claims are managed by the Board's subsidiary, Coal Mines Insurance Pty Ltd, which was purchased by agreement from colliery proprietors in 1948.

² The JCB's Order No. 10 requires coal producers to effect all workers compensation insurance for their employees with the Board.

³ For a detailed description of workers compensation arrangements in Australia see IAC 1989, *Government Non- Tax Charges, Vol.4*.

Participants considered that the workers compensation arrangements in the coal industry impose a substantial cost to the industry. EXXON Coal and Minerals Australia Limited submitted (sub. 58, p.8) that workers' compensation premiums represent between 5 and 10 per cent of the cost of employing a mine site worker. In addition, Oakbridge proposed (sub. 32, p.41) that the excessiveness of workers' compensation premiums paid by the coal industry has been demonstrated consistently in recent years by the need for some of the excess in premiums to be rebated to employers (4 per cent was rebated in both 1987 and 1988). Oakbridge submitted that "the NSW Coal Association estimates that \$1 for every tonne of exportable coal produced is absorbed by payment of workers' compensation premiums. Oakbridge's figure is somewhat less, but of the same magnitude." (sub.32, p.40)

A number of special provisions apply to coal mining which inflate the cost of workers compensation premiums. Coal industry employees in NSW are entitled to greater workers compensation benefits than are other employees in NSW under the NSW Workers' Compensation Act (NSW Coal Association, sub. 140, p.3). More specifically Oakbridge submitted (sub. 32, p.40) that in addition to the normal workers' compensation entitlements a Coal Industry Tribunal award provides coverage for accident pay - 78 weeks pay (half on award rate plus bonus and half on the award rate). In 1987 amendments to the Act excluded the coal industry from limits placed on the maximum allowable benefits payable. Oakbridge estimated (sub. 32, p.40) that these additional benefits had resulted in extra costs of \$10m in 1988-89, which was equivalent to 17 per cent of the amount paid in premiums.

Oakbridge added (sub. 32, p.40) that the coal industry is also subject to discrimination from special provisions in Part 18, schedule 6 of the Act which allow for a continuation of the redemption of weekly earnings as a lump sum only for coal miners, resulting in additional costs of \$23m per annum borne by the industry.

As at 30 June, 1990, the Workers' Compensation Fund's balance sheet showed assets totalling \$437 million, made up of fixed term securities \$263 million (at cost), fixed assets and real estate \$65 million (largely at current valuation) and current assets \$108 million. Liabilities, apart from the Fund's reserves of \$74 million, consisted of provisions for outstanding claims (\$270 million), staff long service leave, superannuation and recreation leave (\$4 million), provision for distributions to policy holders (\$88 million) and current liabilities of \$1 million (NSWCA 1990, p.55). In recent years, the JCB's insurance activities have been 'consistently profitable' despite significant reductions in the average premium rates (JCB, sub. 18, p.45). This has allowed the Board to build up substantial investments.

EXXON Coal and Minerals Australia Limited expressed (sub. 58, p.9) concern about these 'surplus funds' and suggested that they should be "administered in a more efficient and professional manner to eliminate overfunding and reduce premiums and provide a more efficient service to employees."

In addition, these reserves have been the source of funds for the Board's Welfare Fund which finances programs such as grants for community amenities, the cost of the Board's medical and rehabilitation services, and mineworker training (NSW Coal Association, sub. 140, p.4). Oakbridge opposed the diversion of reserves to non-compensation purposes and said that this practice contributed to the high level of premiums.

Such activities should be funded by other means, not out of premiums income, and certainly not without consultation and consent.(sub. 32, p.41)

The NSW Coal Association provided a comparison of the NSW coal industry and Queensland coal industry in relation to time lost due to workers' compensation absences in 1988-89. The NSW underground sector lost 3.06 per cent of shifts and the open-cut sector 1.42 per cent, while the Queensland underground sector lost 1.96 per cent and the open-cut sector lost 0.52 per cent.

Oakbridge submitted (sub. 32, p.41) that substantial progress has been made in reducing accidents and occupational diseases in the coal industry although it did not believe this had been reflected in the cost of claims. Claims have increased from 4.6 per cent of declared wages in 1971 to 8.6 per cent of declared wages in 1987. According to Oakbridge, the NSW Coal Association has estimated that more than 50 per cent of workers' compensation claims are due to the absence of appropriate incentives to return to work. Oakbridge recommended that changes to the Workers' Compensation Act to bring the coal industry's rehabilitation obligations into line with those in other industries would reduce the cost of workers' compensation in the industry and would enhance the continuity and quality of the coal mining workforce.

The NSW Coal Association recommended (sub. 45, p.16) that:

The Workers' Compensation Scheme should be established as a separate, stand alone scheme. The scheme should also be reviewed by independent experts in terms of its funding and administration.

Choice and cost efficiency are critical issues requiring careful scrutiny when examining the efficiency of any workers compensation scheme. The JCB has the monopolistic control over workers compensation in the NSW coal industry. The monopolistic supply of any goods or service raises concerns that the lack of competitive pressures will result in reduced incentives to minimise costs. Participants have expressed concern about the cost-effectiveness of the JCB's scheme. The Commission considers that the main issue is not the total cost of workers compensation per se, but whether alternative arrangements could be implemented, which would enable its delivery at lower cost to employers and the community at large. In addition, evidence suggests that reserves created from workers compensation premiums are being diverted for non-compensation purposes and the Commission considers that this practice is not a normal business operation.

The JCB Workers Compensation Scheme is currently subject to an actuarial review initiated very recently by the Board (NSWCA 1990, p.57).

Statistical Returns

Orders Nos. 5 and 36 require consumers and producers of coal to provide to the JCB detailed statistical returns of coal produced or consumed. Consumers must send in weekly returns while producers must send in fortnightly returns. A copy of Order No. 36 and a copy of a Fortnightly Coalmining Return is contained in Volume 4. The NSWCA was "not clear why such statistics are

required in such detail and at such frequent intervals nor why the Australian Bureau of Statistics could not collect from the coal industry any statistics needed by governments and the public, just as it does for most other industries. The Bureau's legislation governs and protects the rights of persons in ways not contemplated in the Coal Industry Act."(NSWCA 1990, p.15)

Health and safety regulations

The number and complexity of health and safety regulations which the coal mining industry must adhere to is high. There are regulations administered by both the JCB and the Department of Minerals and Energy (ie the Coal Mines Regulation Act).

- Role of the Joint Coal Board

Under the Coal Industry Acts the JCB is given special responsibility with respect to the health and welfare of mineworkers and in particular with respect to the problems of airborne dust in coal mines. Early efforts were directed towards the elimination of pneumoconiosis and other lung diseases from the industry. The JCB speculated that its heavy involvement had led to the virtual elimination of dust claims from the industry (Spratt & Caffin 1990, p.15). The JCB indicated that approximately 45 doctors, nurses, and rehabilitation specialists are employed in 4 centres serving the coal industry. In addition to its health and welfare responsibilities, the JCB submitted (sub. 18, p.49) that it undertakes a number of measures to promote and support safety awareness and reduce accidents in coal mines. The JCB's activities in the health and safety areas are closely associated with and financed from funds generated from the Board's insurance activities.

The main activities of the Board in relation to occupational health and safety include:

- occupational health and rehabilitation service for mineworkers;
- control of airborne dust in coal mines;
- mineworker training; and
- accident data information service.(sub. 18, p.49)

KCC submitted (sub. 87, p.6) that it recommends private rehabilitation services be used for its injured workers, but the company was experiencing union and JCB pressure to use the JCB rehabilitation facilities. KCC recommended that the JCB's role in providing medical services under its functions of providing occupational health and rehabilitation should be "transferred to the private sector and rehabilitation services, if retained, should be on a commercial basis."

The NSWCA acknowledged (NSWCA 1990, p.73) that occupational health and safety is a legitimate area for regulation, and it recognised the instrumental role of the JCB, in particular in the control of lung disease in the industry. However, it argued that there is no reason for duplication of regulatory authorities for occupational health and safety and suggested that the Coal Mining Inspectorate of the New South Wales Department of Minerals and Energy is the appropriate regulatory authority. In relation to medical screenings and associated services currently operated

by the JCB the NSWCA believed that real needs (in relation to occupational health and safety) would be more accurately identified and more efficiently satisfied by coal companies in the Board's absence.

- Coal Mines Regulation Act

The NSW Government submitted (sub. 162, p.11) that 5000 approvals have been issued since 1943 for equipment to be used in NSW coal mines. The number of approvals has increased from approximately 50 p.a. in 1978 to 350 p.a. at present, while the backlog of processing approval applications has fallen from 12 months to 3 months during the same period.

The Australian Collieries Staff Association believed (sub. 34, p.14) that the Coal Mines Regulation Act and Regulations, as administered and enforced by the Department of Mineral Resources and Energy, is the cornerstone of safety in the coal mining industry. It considered there is a need for special coal mining legislation because there are so many hazards to life and health in coal mines, such as methane, carbon monoxide and falls. ACSA maintained it was not sufficient to assume that companies will safeguard their investments by introducing and maintaining adequate safety measures. Instead it submitted (sub. 34, p.14) that "human life and health require a higher standard than an investment decision".

Bolton Point-Marmong Point Progress Association submitted (sub. 47, p.A3) that:

Advanced technology, improved mining methods and modern equipment, have created an urgent need to address the inefficiencies of the Coal Mines Regulation Act and the approval process for mining operations. The Act has become outdated and does not address the consequences of planned subsidence on the surface. The mining approval process does not allow any party to take part in the decision making process of the mining plan which may impact on the environment and the community.

The NSW Coal Association proposed (Transcript p.990) that the Coal Mines Regulation Act had "been developed under a philosophy that has attempted to regulate out of existence any dangers." Oakbridge submitted (sub. 32, p.27) that the coal mining operations in NSW have recently been restructured, along with technological developments, which have rendered the Act outmoded. The NSW Coal Association asserted (sub. 45, p.12) that the Coal Mines Regulation 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 ... The present Act overspecifies management, supervisions and responsibility structures, unnecessarily restricts the operation of mines, entails inappropriate bias towards underground operations and includes provisions that are more appropriately, if at all, dealt with by industrial awards or agreements.

The NSW Coal Association further submitted (sub. 45, p.13):

... the most desirable system is one which provides for a high degree of industry involvement in setting and administering health and safety standards and operational procedures to achieve them and which recognises differences between enterprises and between mines. The Association [believed] that such a system would increase occupational health and safety standards by encouraging enterprises to look for ways to improve the safe operations of their mines.

Despite the highly prescriptive and detailed nature of the Coal Mines Regulations Act the coal industry is adjudged to have a poor safety record. According to Austen and Butta (sub. 98, p.8):

Whilst considerable improvements to safety performance have occurred in recent years, the performance level is poor relative to other industries and to the best international coal industry standards. The Act can encourage a mentality which perceives conformity with the Act as an acceptable objective rather than striving for international excellence. A workers Compensation system which can encourage abuse compounds the problem.

In relation to claims from the Australian coal industry about the cost of compliance with health and safety regulations the UMFA drew (sub. 23, pp.28-30) the Commission's attention to a study conducted by the US Department of Commerce, which compared costs of complying with such regulations. This study indicated that regulations and regulated costs are not high by international standards. However, like all international comparisons it is hard to determine whether comparisons have been made on the basis of "like with like". The Commission considers that it is more important to determine whether Australian regulations are cost effective, or whether it is possible to reduce costs in some way.

- Further comments on health and safety regulations

The Joint Coal Board and the inspector appointed under the NSW Coal Mines Regulation Act both administer regulations aimed at maintaining health and safety standards. This results in unnecessary administration and compliance costs, and can lead to additional problems due to the possibility of contradictions and duplication between these different authorities.

The Commission acknowledges and supports the current review of the Coal Mines Regulation Act 1982 (NSW Government, sub. 162, p.10). The intention is to test the Act's appropriate level of prescription. "Open cut operations will be more clearly distinguished from underground operations, and the greater danger of underground operations will be acknowledged." However, the Commission considers that the issue of duplication should also be examined.

Industrial relations

Australian coal mines have labour productivity levels that are high by international standards (see Table 22.1). Australia ranks closely with the US and far above other major coal producing countries - twice that of the labour intensive industry in South Africa and four times the old, deep industries in Europe (JCB, sub. 18, p.8).

Significant productivity improvements have occurred over the last decade - for example, nearly 60 per cent growth in productivity in the black coal industry (JCB, sub. 18, p.7) - due to developments in technology, closure of some uneconomic mines and changed work practices.

Table 22.1: Output per manhour, United States and Australian Coal Mines⁴
(Saleable tonnes)

	<i>Calendar Year 1988</i>				<i>Financial Year 1988-89</i>		
	<i>US</i>	<i>NSW</i>	<i>Qld</i>	<i>Aust</i>	<i>NSW</i>	<i>Qld</i>	<i>Aust</i>
U/ground mines	2.16	1.91	1.64	1.86	1.97	1.58	1.90
Open cuts	4.83	4.11	4.51	4.19	3.88	4.64	4.23
All mines	3.22	2.44	4.11	3.01	2.45	4.20	3.07

Source: Joint Coal Board, submission 18, p.8.

Many significant restrictive work practices were removed as a result of the September 1988 CIT decision. These changes resulted in: increases in the standard shift length from 7 to 8 hours, with provision for extension by agreement, whilst maintaining an average of 35 hours ordinary time per week; the removal of the 3 to 4 week Christmas shut down (allowing production to continue for 52 weeks a year); allowing non-production work and underground development operations 7 days per week; allowing underground production on 6 days a week; allowing make-up production lost through weather conditions, breakdowns and industrial disputes generally on a 6th day in the week; providing for production on overtime as an award right; providing for the implementation of rostered systems of working (within the scope of 8 hours per shift)

However, it is not clear to what extent the industry has benefited from these developments. Many participants claimed that the gains made possible by more flexible practices have been almost completely, or entirely, offset by higher wages for this additional productive time. For example, the JCB stated (sub. 18, p.39) that since 1986-87, wage and salary increases in underground mines have approximately equalled productivity gains with unit labour costs remaining stable. During the same period, unit labour costs in open cut mines have exceeded productivity gains by about 11 per cent.

EXXON Coal and Minerals commented (sub. 58, p.8) that:

The benefits of moving to the new arrangements (restructuring) have still to be seen. Although our miners have received up to a 26 per cent increase in wages, no productivity increase has yet been noticed.

A reflection of the high cost paid for improving work practices can be seen by the number of companies utilising the new production opportunities. Of 27 underground mines, 11 made no changes to operations (ie retaining pre-September 1988 arrangements), 11 are producing six days a week on a permanent basis, and only two mines have reached agreement with employees for nine hour production shifts (JCB, sub. 18, p.36).

⁴ According to the JCB (sub.18, p.8) the US and Australian data are not strictly comparable because of different reporting bases. US open cuts include lignite mines, while office workers are excluded from the US calculation but included in the Australian. These factors understate the Australian productivity figures vix-a-viz the US.

In addition, EXXON Coal and Minerals submitted (sub. 58, p.7) that only a few opencut operations in NSW have moved to the new rostering system which was negotiated under the changed system.

This [was] because the marginal costs in proceeding to a 6-7 day roster were greater than the marginal revenue generated by such a move.

Notwithstanding any improvements from the 1988 reforms, restrictive practices still remain a significant barrier to greater labour productivity. For example, there are restrictions on employers' ability to hire workers as employers are required to select only from a union list. EXXON submitted (sub. 58, p.8) that it would like the right to hire employees which it considers suitable for its operations rather than have the relevant union supply a list from which to choose. EXXON proposed that this practice tended to prevent new workers entering the industry and workers who temporarily leave the industry from regaining employment.

A further restrictive practice is that in many underground mines, shift changes must occur above ground. This involves stopping production for the duration of the changeover which can mean hours lost each day.

The level of industrial disputes in the coal industry is excessively high in comparison to other industries. In 1988, for example, the Australian coal industry lost 15 548 working days per 1000 employees which was 57 times the national average of the time. Since 1988 there has been a dramatic improvement: in the 12 months to October 1989 the coal industry lost 7566 working days per thousand employees, a figure 37 times the national average, and in the 12 months to August 1990 the industry lost 4319 days, a figure still 32 times the national average (ABS 1990). EXXON Coal and Minerals submitted (sub. 58, p.8) that the strike record of the coal industry is due partly "to the large number of unions involved within the industry in getting coal from the mine to the port and the lack of flexibility within the unions to adapt to new working conditions as the industry changes."

Relations between the employers and unions are generally poor, stemming largely from the many bitter industrial battles fought in the past. This has fostered an "us and them" philosophy which at times blinds either party to the other's point of view. Although DIR submitted (sub. 145, p.15) that relations have improved more recently under award restructuring. Better relations between employers and employees are likely to result where conflict resolution and negotiations are more decentralised and enterprise focussed, and where third party intervention is minimised. Settlement of industrial disputes should be encouraged between the parties themselves (see Section 17 for a more detailed discussion of labour issues for the mining industry generally). But, industrial relations arrangements in the coal industry are quite different from any other industry since a separate institutional body, the Coal Industry Tribunal, regulates terms and conditions of employment in the industry.

The Coal Industry Tribunal

The continued operation of the CIT has been considered by two Inquiries. In 1985, the Federal Government's Committee of Review into Industrial Relations Law and Systems (the Hancock Committee) recommended:

The Australian Government to enter into discussion with the NSW Government as provided for in the Coal Industry Acts (and consult with other State Governments as considered necessary) with a view to the abolition of the Coal Industry Tribunal and the regulation of the coal mining industry, on a federal basis, by awards of the Commission made under Division 1 of the principal Act (1985, pp.437-438).

In February 1989, Professor Niland reported to the NSW Government on the State's industrial relations system and made various recommendations (Niland 1989). Among other things, he stated:

The circumstances that existed at the time the Coal Industry Tribunal was established have changed significantly, with much stronger attention now to industry or enterprise directed restructuring, within the framework of centrally determined principles. This lessens the justification for specialist tribunals, including the Coal Industry Tribunal. Accordingly, the appropriate action for the New South Wales government is to co-operate with the federal government in rationalising the tribunal structure to remove the Coal Industry Tribunal. (Recommendation 32) (Niland 1989, p.85)

In response to the Hancock Committee's recommendation, the Federal Government did consider the abolition of the CIT. In April 1988, the then Minister for Industrial Relations made the following statement:

In relation to the Coal Industry Tribunal, since its powers and functions are governed by both Federal and NSW State Legislation, under an agreement between the two Governments, all changes require the concurrence of the NSW Government. In view of the poor industrial relations performance of the coal industry, the Government believes that there is a strong case for change in, if not the complete abolition of, the Coal Industry Tribunal. (Willis 1988)

The New South Wales Government submitted (sub. 217, p.15) that:

... the New South Wales Government has no objections [to] disbandment of the Coal Industry Tribunal, and is willing to co-operate with the Commonwealth Government in absorption of the Tribunal within the general jurisdiction of the Australian Industrial Relations Commission, given the Tribunal's present legislative basis.

Despite the above inquiry findings and statements of the Federal and NSW Governments, the CIT still exists.

Some participants in the inquiry supported the continuation of the CIT. For example the UMFA proposed (sub. 23, p.5) that in terms of structure, procedure and industrial powers, the present coal industry arbitration system is ideally suited to the special sociological, cultural and geographic characteristics of the industry. The following is a summary of the UMFA's (sub. 23, pp.76-7) arguments:

-
- the system allows for the early listing and hearing of disputes;
 - the procedure for listing does not involve the complexities of other jurisdictions;
 - the extensive powers of the coal arbitral bodies promote very quick settlement of disputes with a low incidence of legalism;
 - the isolation of the coal system from the general system prevents the flow to other industries of the higher leave and hours standards;
 - the single member Tribunal allows for speedy decisions on industry wide matters which are accepted as final;
 - the appeal process within the coal arbitration system allows for the review of decisions from the LCAs and the Board of Reference;
 - the physical location and immediate availability of arbitral bodies in coal mining districts enhances dispute settlement;
 - the knowledge of the intricacies and customs of the industry possessed by the Chairpersons of the arbitral bodies as a result of their long involvement in the industry enhances dispute settlement;
 - the structure of the system enhances the decentralisation of wage fixation in the industry; and
 - the principle of having regard to decisions in other jurisdictions maintains links with the general systems, while allowing for special circumstances of the industry to be taken into account.

In addition, the UMFA argued (sub. 23, p.77) that "[d]oing away with these substantial advantages by absorbing coal into the Industrial Relations Commission will not lead to more efficient dispute settlement, or to a reduction of disputes or to a reduction of earnings". It asserted that "[t]he Industrial Relations Commission is admitted to be cumbersome, inflexible and beset with constitutional difficulties, and therefore proposed that absorption of the CIT would only lead to more and not less disputes in the coal mining industry."

The Australian Collieries Staff Association (sub. 34, p.6) also favoured the retention of the CIT and the Local Coal Authorities. It proposed that the LCAs are at the forefront of conciliation and arbitration since they are able to act quickly on a local basis "through the very experienced and able Chairmen holding office". Disputes were seen to be settled swiftly, allowing production to continue or resume quickly. ASCA proposed that the high levels of industrial dispute when compared to the rest of the industry, and high wages levels compared to those outside the industry are not the Tribunal's fault but the direct result of the following:

... the long bitter history of industrial relations in the industry ... the innate conservatism of many miners and their union officials ... the dirty and dangerous conditions under which much production takes place ... the incidence of work related injury and disease ... the inability of many proprietors to engage in meaningful discussions and negotiations.

ACSA proposed (sub. 34, p.7) that it was only the Tribunal, Local Coal Authorities and Queensland Board of Reference which have specialised knowledge and experience to handle matters in the coal industry. They believed that the Tribunal's decision process already represented the end of a long process involving bargaining, negotiating and sometimes industrial action, and thus the idea that appeals to a higher authority would be beneficial were not seen to be necessary.

The abolition of the CIT would not necessarily result in a loss of specialised knowledge and experience (as argued by UMFA and ACSA), since the present incumbents could be transferred to the mainstream tribunals with continuing responsibilities for the coal industry.

The ACA drew the Commission's attention to the arrangements in Queensland, where local disputes requiring third party assistance are referred to a Board of Reference, based in Brisbane who travels to mining districts as required. In addition, the ACA suggested (sub. 71, p.34) that the existence of LCAs in coal mining districts has encouraged parties to take the easy way out - to abrogate the responsibility rather than address and resolve issues on the minesite.

If a local dispute settling authority is considered desirable, there appears to be no reason why the Boards of Reference provision under the (Federal) Industrial Relations Act (Section 131) could not be used.

Absorption of the CIT into the mainstream industrial relations framework would also help to remove the problem of appeal rights that industry identified. For example, Kembla Coal and Coke submitted (sub. 87, p.8) that in its experience "it is extremely rare for the CIT in Sydney to overturn a decision by the LCA". In its view there was virtually no avenue of appeal in practice. In addition, the ACA submitted (sub. 71, p.33) that the lack of appeal rights and the inability to refer matters of major principle to a Full Bench had disadvantaged the industry.

Participants commenting on the role of the CIT generally proposed that it be subsumed in the Australian Industrial Relations Commission. CRA added that the same reasons for abolishing the CIT apply equally to the Western Australian Coal Industry Tribunal.(sub.238, p.1)

The Joint Coal Board

While the JCB has powers in employment, recruitment, manning levels, promotions, training and industrial welfare practices, these are rarely used. However, the JCB has on occasions intervened. For example, in 1984 the JCB ordered the reinstatement of 600 retrenched workers, and in 1985 made decisions on a five day roster system. These actions were considered by one participant (Oakbridge) as unnecessary. In the first case, the intervention was considered to complicate industrial relations, and in the second, intervention was not considered necessary or sensible as

rostering was already organised on a voluntary basis (sub. 32, p.37). The Commission supports the view that this type of intervention serves to confuse industrial relations. It further believes that while many of the JCB's powers are not used, they improperly reside with the JCB. As with the CIT, the reasons for the JCB's creation (to ensure essential coal supplies in the post war period) are now largely irrelevant. While many of the powers of the JCB are not currently used, this may not always be the case.

In addition to these infrequent rulings, the JCB has adopted a more regular role as independent arbitrator between union and management. However, the Commission is not convinced that JCB intervention is the most efficient means of achieving better industrial understanding. For example, the NSW Coal Association claimed that the JCB's role as arbiter had weakened communications between workforce and management and that its existence encourages laziness in both parties (sub. 45, p.16).

Concluding comments on industrial relations

Abolition of the JCB and the CIT is a contentious issue, and is likely to receive strong opposition from relevant unions. For example, some would argue that the award restructuring process is too important to jeopardise by raising other contentious issues. However, for those resisting change there will always be some issues of timing that makes change inappropriate.

Whatever the historical justification for the creation and continuance of the CIT and the JCB, circumstances have changed. The Commission does not consider the coal industry a "special case" and does not support its separation from mainstream industrial relations. While a more decentralised approach is preferred by the Commission, having separate special arrangements for one sector of industry cannot be justified. Ultimately, the Commission's view is that many factors influencing the relations between employees and employers should be left in the hands of the parties immediately concerned. Third party intervention should be minimised as much as possible.

Marketing

The high level of regulation in the coal industry also extends to the marketing of coal. This is now discussed.

Role of the Joint Coal Board

The 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.

According to the Board (sub. 18, pp.57-59) its involvement in trade promotion and development is both indirect and direct. Indirectly it has established an international centre for training people from developing countries on the use of coal in power generation. These courses aim to promote the use of coal in new and developing coal importing countries.

Directly, the JCB considers its role is to act as a facilitator of direct initiatives in market promotion. It gave as an example a the proposal for a joint user stockpiling facility in Europe adding that there was presently a lack of industry interest because of factors such as market considerations in Europe and freight costs.(Transcript, p.1100)

The New South Wales Coal Association submitted (sub. 45, p.16) that:

... the Board [JCB] has increasingly moved into marketing in such a manner as to create a serious risk of being counter-productive to companies' marketing efforts.

Oakbridge contended (sub. 32, p.31) that the JCB'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 foregone in favour of interstate and overseas competition." It added that the JCB generally requires proof of the existence of firm sales contracts before granting provision for production increases, even though the nature of financing mining projects has changed. That is, previously coal companies arranged long term sales contracts and used these contracts to finance mine development. Currently, in order to capture an opening in the market or to be internationally competitive, investment decisions for coal have to be made on the basis of commercial assessments of market prospects.

According to Oakbridge:

Being unprepared to back those assessments (which must include careful assessment of other suppliers' intentions) is tantamount to opting out of market growth; being disallowed from backing them is government imposed stagnation.(sub. 32, p.31)

In response to these comments 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.

JCB Order No. 37 requires NSW coal exporters to provide the JCB with all relevant commercial details of their coal sales contracts, including actual copies of the contracts, so the JCB can set up a marketing database. This was seen by Oakbridge as an intrusion into commercial transactions, especially since responsibility for controls is exercised by the Federal Department of Primary Industries and Energy.(sub. 32, p.32)

Volume 4 Section 7 contains a copy of JCB Order No.37, and a Coal Export Contract Details Return. The level of detail required demonstrates the compliance costs of regulations governing the marketing of coal.

Proposal for a national coal authority

It has been put forward, as an alternative proposition, that Australia's position as an exporter of coal would be enhanced by the establishment of a national body such as a national coal board. For example, according to UMFA (sub. 23, pp.58-9) the primary source of Australia's marketing problems is that "Australian coal exporters are only an industry united by having mines in the same country or state. In fact there is no single interest among coal exporters. There is instead a multitude of individual corporate interests which are determined by the particular circumstances of the company". Thus, the UMFA contended that a stronger hand was required to alleviate the problem of divided interests in the coal industry.

The UMFA advocated the introduction of a statutory body "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" (sub. 23, p.73). The Federation proposed (sub. 23, pp.73-4) that the powers of this body should include an ability to operate a system of export controls and an ability to undertake long term planning of industry development (especially in relation to growth of excess capacity).

In contrast, the Australian Coal Association rejected (sub. 142, p.3) the proposal of a national coal authority in any form. "Planning production and attempting to regulate markets go hand in hand." According to ACA (sub. 142, p.5):

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 UMFA said its proposal was an attempt to "reduce the level of disunity and competitiveness between coal exporters"(sub.23, pp.69-70) since it believed there would always be some exporting companies which have a material interest in entering into settlements which undermined the interests of the rest of the industry. ACA speculated that this statement "encapsulated the Federation's objective of standardising competitiveness across the industry by dragging the more efficient operations down to the lowest common denominator set by the less efficient, typically labour intensive mines." (ACA, sub. 142, p.5)

Kembla Coal and Coke (sub. 87, p.16) said that the establishment of a marketing authority:

... would help perpetuate the myth that coal is somehow "special" [and] would be likely to do great damage to Australia's hard won market position as the worlds leading exporter.

KCC believed that in the face of such aggressive action buyers would switch to alternative suppliers. It explained how during the 1970s the Japanese developed new coking coal mines in Canada in response to aggressive action in resources policy by the Australian Government. KCC submitted that bureaucratic interference should be minimised, not increased.(sub. 87, p.16)

The NSW Coal Association believed (NSWCA 1990, p.21) "that monitoring the full commercial details of export contracts, in the context of the Board's [JCB] responsibilities, is extraordinarily intrusive and, quite simply, indefensible." Hence, it recommended that Order No.37 should be rescinded.

As discussed in Section 10, the Commission is opposed to the current regulatory system of export controls since they impede competition within Australia, and do not allow mineral exporters to act competitively in the world market. By extension, the Commission would oppose any proposals for a national coal board or marketing authority.

Role of the Australian Coal Marketing and Technology Council

The ACMTC was set up by the Commonwealth Government in response to union pressure to establish a national coal marketing authority, and as an alternative to it. ACA was opposed (sub. 71, p.16) to the ACMTC as the existence of a separate marketing council for the coal industry had the potential to impact significantly on Government policy and hence, industry practice. Also its activities were seen to be duplicative, and the Council was considered not to understand detailed and up-to-date coal marketing issues.

Australian Coal Industry Council

ACA stated that the existence of this Council was born out of the perception that the coal industry is somehow special. Philosophically, ACA could not see any need for the ACIC, although, it supported the retention or even enhancement of this consultative mechanism since it is "small; it does not bring in any extraneous parties; and it is consultative"(Transcript p.2636). ACA stated that the ACIC was preferable to having third party involvement such as the Australian Coal Marketing and Technology Council.

Even though the functions of the ACIC are purely consultative, the Commission can see no need for it. It may be viewed by some as the lesser of several evils (including the ACMTC and a national coal authority), but it still represents an unnecessary intrusion into the industry.

Research and development

The Australian coal mining industry is heavily dependent on technology and consequently effective research and development is a vital component of a successful coal industry.

The CSIRO submitted (sub. 61, p.22) that a considerable number of Australian coal and mineral firms existed which were unable or unwilling to provide a high or even a medium research and development capacity continuously. Consequently, the CSIRO supported the coal research and development levy, and believed it had been instrumental in ensuring a base level of research and development in the coal industry. The CSIRO took this proposition further by suggesting that direct public sector research and development funding decisions should be made on the basis of potential and current economic benefit criteria. In this sense they proposed that the coal and minerals sector has not received the priority in public sector funding which is commensurate with its economic importance at present, nor relative to its future role in national welfare.

In contrast, ACA believed (sub. 71, p.29) the Coal Research Trust Account (CRTA)/National Energy Research, Development and Demonstration Council (NERDDC) arrangements were no longer appropriate because of the introduction of the 150 per cent tax concession which has led to the virtual elimination of Energy Research Trust Account (ERTA) contributions to NERDDC. ACA submitted that the growth of the coal industry has meant that a number of companies now pay more than \$1 million to the CRTA each year and are consequently "less prepared to accept decisions by third parties on how sums of this magnitude are used." ACA added (sub. 71, p.29) that strict cost-benefit criteria were not being adhered to for various research programs since:

- the system is geared towards providing assistance to a wide range of relatively small projects;
- funding for large projects is difficult to obtain;
- there appears to be a limit to the extent to which the NERDDC national energy objectives can match the industry's commercial priorities;
- there is an inadequate mechanism for the dissemination of results, making it difficult for the potential end users to gain information and creating a risk of duplication of research due to a lack of awareness of activities;
- programme monitoring has been inadequate and there is a general reluctance to withdraw funding from projects whose mid-term results fail to fulfil earlier expectations.

In addition, research levies such as those which exist in the rural sector were seen to divorce the owner of the activity from the research and to a certain extent the responsibility (AMIC, sub. 95, p.8). According to the ACA, levies result in "less involvement in those research projects from companies who are not involved, than you do if the companies are directly involved in controlling the research programme or the organisation that is carrying out that research"(Transcript, ACA, p.815).

The Federal Government is currently examining the CRTA/NERDDC arrangements in the context of introducing either a non-statutory or statutory (along the lines of the Meat and Livestock Corporation) alternative. ACA submitted that its ultimate objective was the elimination of Government involvement in industry-funded research, however in the interim period it proposed an alternative system to the Government's proposal (see Box 22.3.).

Box 22.3: Alternative industry proposal for the establishment of a coal research and development corporation

ACA outlined the following aspects of the Government proposal which it saw as raising problems:

- Without Government assistance, the Corporation would commence with a substantial funding deficit, and because of the likely timing of receipts and expenditures, the Corporation would become insolvent.
- The proposed two-stage process for appointing the Corporation Board of Management whereby Board members would be nominated by a separate Selection Committee drawn from industry and government, would be unwieldy and inappropriate.
- The Board would be chaired by a representative from the Department of Primary Industries and Energy. The Association believes that this would detract from the intention of the Corporation to provide industry autonomy over management of its CRTA contributions.

To address these problems, the Association proposed an alternative system under which the industry would:

- undertake, for at least three years, to contribute to its own fund the equivalent of 5 cents per tonne of saleable productions, subject to repeal of the existing levy with this amount, plus interest being the minimum expended on research by the industry;
- establish its own mechanism for allocating and managing these funds;
- assume responsibility for the management of projects committed by NERDDC provided that the Government contributed sufficient funds to cover the gap between existing CRTA reserves and forward funding commitments.

(ACA, sub. 71, pp.29-31)

As an alternative proposition, AMIC believed (sub. 95, p.9) the most cost effective research was where "commercial interests not only contribute to the funding but where they set the research priorities and are involved in the oversight of the projects directly". It proposed that industry research arrangements like Australian Mining Industry Research Association and Australian Coal Industry Research Laboratories are more effective for industry research than arrangements such as the NERDDC.

If a market imperfection does exist in coal research and development, and if the benefits of correcting this imperfection outweighed any costs of implementing such a system, then the government would have a role in administering a research and development levy. However, the Commission considers that since the industry is prepared to meet its own needs and as it can capture the benefits of its own research and development then there is no justification for government intervention in the form of a levy.

The future for the JCB and QCB

This section has examined the different functions of various government authorities regulating the coal industry. But that analysis leads to the more general question of whether the Joint Coal Board and the Queensland Coal Board should continue to exist.

As to the Joint Coal Board, the NSW Coal Association submitted (sub. 71, p.19) that "[t]he NSW Coal Association (NSWCA) has, for some years, advocated the dismantling of the JCB and the allocation of certain of its functions (i.e. those which are appropriate to retain) to appropriate NSW or Commonwealth Government bodies or the private sector. The NSW Coal Association believes that the existence of the JCB is not consistent with the needs of the industry. Specifically, the NSW Coal Association believes that:

- the rationale for establishment of the Board no longer exists;
- many functions of the Board duplicate other Government activities and are more appropriately carried out by the latter;
- the Board represents an unnecessary proliferation of Government bodies;
- the powers of the Board are inconsistent with modern Government management practice;
- the Board carries out commercial services which:
 - should be provided by private enterprise,
 - are not established on a proper commercial basis;
- the activities of the Board, represent its perception of need, rather than the perception of the industry or Government;
- the Board uses its powers to apply workers' compensation funds, built up from industry premiums, for purposes not agreed by the industry;
- the Board has increasingly moved into marketing and other areas in such a manner as to create a serious risk of being counter-productive to companies' efforts."

Both the ACA and the NSWCA expressed their support for the current review of the Joint Coal Board.(ACA sub.232, p.2, NSWCA sub. 231, p.1)

As to the Queensland Coal Board, the Queensland Coal Association initially submitted (sub. 70, p.12) that:

Clearly, the expansion and change of the Queensland Coal Industry since 1948 has left the Queensland Coal] Board without its intended role. Most of its powers are dormant ... The Association believes the Board should be disbanded and its Act repealed. However, this should not happen while the Joint Coal Board remains in existence. To its credit, the QCB has taken a much less interventionist role than its NSW counterpart, and the Association would be loathed to contribute to a situation where the position vacated by the Queensland Board was to any degree filled by the JCB.

In a subsequent submission, however, the QCA expressed concern about the Queensland Government's decision to expand the QCB. The change in policy towards the QCB was a cause of "confusion and consternation" to QCA members, who believed the decision was "contrary to the general tide of Government and community thinking towards leaner public administration and less involvement in private business affairs." (sub. 246, p.1)

The Commission's view

Changed conditions have in many cases weakened or totally negated the original arguments for government intervention in the coal industry. As a result, and in light of the now highly competitive nature of international coal markets, the Commission agrees with the Coal Associations that neither the JCB nor the QCB has a continuing role to play and the Commission welcomes the current review of the JCB jointly by the Commonwealth and NSW Governments. In addition the Commission shares the concern of the QCA that the change in Queensland "may be a first step towards duplicating the mistakes made in New South Wales with respect to the JCB" (QCA, sub. 246, p.2).

22.5 Conclusions

The perceived uniqueness of the Australian coal industry has meant that it has become subject to a wide range of government interventions. Many of them have no counterparts in other industries. The Commission considers there is little evidence to suggest that the extra degree of regulation is successful. On the contrary, the evidence suggests that it is unsuccessful and highly duplicative, and thus impairs the efficiency of the coal industry.

Black coal is Australia's largest export earner and any increases in efficiency could yield large benefits. With prices realised by producers largely beyond their control, cost savings are the focus for competitiveness. The removal of all impediments, including unnecessary regulations is essential to allow the industry to become more efficient and internationally competitive.

In particular, the Commission recommends:

- that the JCB and QCB be disbanded and any necessary ongoing functions allocated to other existing bodies;
- that the Coal Industry Tribunal and the Western Australian Coal Industry Tribunal be disbanded and their functions assumed by the Industrial Relations Commission or equivalent state body;
- that the research and development levy be abolished. (If this levy is retained, however, research programs should be responsive to industry needs and should adhere to strict cost-benefit criteria).

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23 THE URANIUM INDUSTRY

The uranium industry in Australia is subject to a number of government interventions which do not apply to other mining and minerals processing activities. The most important of these is the Commonwealth Government's 'three mines' policy. Public debate on uranium-related issues tends to revolve around two arguments: environmental/safety concerns; and the likelihood or otherwise of commercial opportunities emerging, based on guesses concerning the long-term balance between the supply of and demand for uranium. The Commission's view is that Australia could reap substantial benefits from reduced government intervention in the Australian uranium industry.

Uranium mining - like coal mining - is an activity singled out for special treatment by governments in Australia. By using its trade powers, the Commonwealth Government has limited the number of uranium mines to three.¹ Uranium is the only mineral whose ownership is reserved by the Commonwealth Government in the Northern Territory. All other minerals are owned by the respective Territory or State governments. Uranium mining is also subject to particular environmental controls and was - until only recently - subject to price controls by the Commonwealth.

This section focuses on the case for and consequences of Commonwealth Government uranium policies.

23.1 Overview of the industry

The Australian uranium industry is currently based on the three mines which are authorised to export yellowcake (uranium oxide or U₃O₈): Ranger and Nabarlek in the NT and Olympic Dam in South Australia. Ranger is located on Aboriginal land in the Alligator Rivers region and is surrounded by Kakadu National Park. The Nabarlek mine is also located in the Alligator Rivers Region of the NT.

In addition to these three mines there are several other well-defined uranium deposits. These are shown in Figure 23.1 and include Jabiluka and Koongarra in the NT, Yeelirrie and Kintyre in Western Australia, Ben Lomond in Queensland, and Beverley and Honeymoon in South Australia.

23A THE NUCLEAR FUEL CYCLE

Uranium is a radioactive ore that when mined and processed (enriched) can be used either as a major energy source or as an extremely powerful weapon.

23A.1 How is uranium fuel made?

The process that uranium undergoes in the fuel cycle is depicted in Figure 23A.1.

Uranium ore is mined and milled to produce uranium in the form of yellowcake or uranium oxide concentrate (U₃O₈). U₃O₈ consists of two main uranium isotopes, U₂₃₅ and U₂₃₈ in proportions of about 0.7 per cent and 99.3 per cent respectively. This concentrate which is in the form of a khaki-coloured powder, is shipped overseas for purification and conversion into uranium hexafluoride (UF₆).

Most reactors however, cannot run on U₃O₈ or UF₆, as the proportion of the power generating isotope U₂₃₅ is not large enough. Therefore, the UF₆ needs to be fed to an enrichment plant which increases the proportion of the U₂₃₅ isotope to about 3 per cent. Two enrichment methods are currently commercially available to increase the concentration of U₂₃₅; gaseous diffusion through porous walls (barriers) and centrifugal processes. Diffusion technology is costly although it provides about 90 per cent of the enrichment capacity in the Western world.

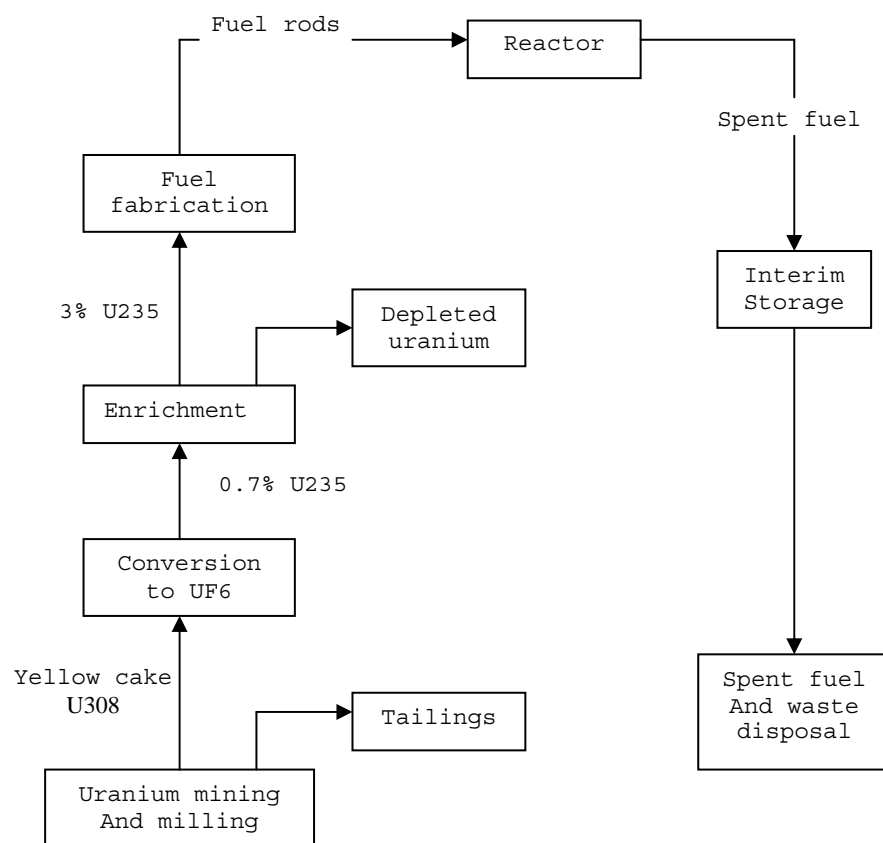
Many of the new and proposed enrichment plants however use centrifuge technology. The centrifuge process exploits the difference in the masses between U₂₃₅ and U₂₃₈. The concept is somewhat like separating cream from milk. The UF₆ gas is introduced in a rotor (centrifuge) rotating at a very high speed. The rotor causes the heavier hexafluoride molecules containing U₂₃₈ to concentrate on the periphery and the lighter hexafluoride molecules containing U₂₃₅ to concentrate near the centre of the rotor, thus making it easy for separating the U₂₃₅ from the U₂₃₈.

Lasers are currently being developed as a means of separating the two uranium isotopes. This process uses lasers to preferentially excite and ionise one of the two isotopes and thereby allows separation by electromagnetic or chemical methods. The laser separation process is attractive because of the potentially lower energy cost and high separation factors available.

Once the uranium has been enriched it goes to a fuel fabrication plant where reactor fuel elements are made. While inside the operating reactor a fission chain reaction occurs in the fuel elements. Fast neutrons are slowed by the water or graphite moderator so that they can cause fission. Neutron-absorbing control rods are inserted or withdrawn to regulate the speed of the reactor. Heat from the fission reaction is conveyed from the reactor core and is used to make steam, which in turn is used to generate electricity.

In addition to increasing the energy obtained per tonne of fuel, enrichment reduces the total mass of spent fuel to be stored and/or reprocessed. More than 80 per cent of the original natural uranium is discharged from an enrichment plant as 'tails' and is not involved either in the reactor or in subsequent reprocessing. However, depleted uranium (the tails from an enrichment plant) is not waste and can be stockpiled for future energy generation use.

Figure 23A.1 The nuclear fuel cycle



23B ESTIMATES OF FUTURE URANIUM DEMAND

During the inquiry participants submitted widely varying estimates of the future world demand for uranium. This is graphically illustrated below. However, as argued in Section 23 the question of which estimates are the more accurate is irrelevant to the issue of whether or not government should intervene in the uranium market on the basis of commercial considerations.

Table 23B.1: Estimates of future uranium demand

<i>Name of Group or Company</i>	<i>High, low or steady demand</i>	<i>Assumptions or conclusions</i>
Uranium Institute	H	Annual demand for uranium to fuel reactors will rise from 42 000 tonnes in 1989 to around 56 000 tonnes in 2005. 26 000t from new projects will be needed to supply the industry's reactors in 1995 through to the year 2000
NUKEM	H	Far east nuclear capacity will increase by 82 per cent by the year 2000. A significant uncommitted market is available for Australian production.
DPIE	H	Diversification tactics by consumers toward Australian uranium.
Pancontinental Mining	H	Three to four new mines equivalent in size to the current production level of Ranger will be required to be brought on line during the current decade to meet future demand.
CRA	H	Boom expected in the mid 1990s. Believes Uranium Institute 2005 prediction true due to most energy generation plants were almost certain of going ahead.
Denison Mining Ltd	H	In the year 1989 about 43 000 tonnes of uranium were needed to fuel the WOCA countries' reactors. In the year 2000, it is projected that 54 000 tonnes of uranium will be needed annually.
Northern Territory Government	H	Demand will increase and Australia will miss out on potential forgone profits.
Uranium information Centre Ltd	H	The government has hindered the development of the Australian uranium industry, and should not play a role as judge of market opportunities.
Australian Nuclear Science and Technology Organisation	H	Until at least the year 2000 the installed global capacity of enrichment and supply will exceed the likely demand. Diversity and security of supply will encourage customers to support new suppliers.
Energy Resources Australia	S	Extended glut - need to consolidate position and cut costs and increase productivity. Market conditions may change in the 1990s provided current stocks are run-down and nuclear power increases its share of energy generation.

Greenpeace	L	Supply is expected to exceed demand in 1996-2000 will be in balance over the next decade. The development of even a small mine will mean that supply would exceed demand.
The Environment Centre Northern Territory Inc	L	Acceleration of denuclearization programmes around the world due to growing public protests about nuclear power. No room for more uranium production capacity in Australia.
Friends of the Earth	L	Large levels of inventories will persist in the long term. Canada and the US plan to increase production.

Source: Various submissions

Attachment 23C: Production costs for uranium deposits

Costs of Uranium Production in US\$/lb								
	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	40 - 45	40 - 45
O	Key Lake	China Export	Cluff Lake	Canon City	Sierra Pintada	Bessings	Akouta	Petrotomics
P		Ranger	Rabbit Lake	Phosphate	Denison E/P	Midnite	Pocos De Caldas	Gas Hills
E		Highland.Morton	Mt Taylor	Grants	Calgary Phos	U. Nisa	Zirovski Irh	
R		Crow Butte	Franceville	Shirely Basin	Phosphate		Las Margarita	
A		Jodal/ Berth	Arizona Strip	Shootering Canyon	Phosphate			
T		Kingsville Res	Hobson	Grants/Church	Stan Leigh			
I			Stope Leaching	Quirke/ Panel	Arlt			
N			Christensen	Rossing Jeffrey City	West Cole			
G			Holiday		White Mesa			
			So Afri Gold					
			Palabora Cu					
			Jaduguda Cu					
			Olympic Dam					
N		Rhode Ranch	Arizona STRip	Dawn Lake	Leuenberger	Juniper R	Marquez	Lakeaway
O				Ruby Ranch	Midwest	Kintyre	McClellan Lake	Saskatch. Res
N				Cigar Lake	Jabiluke	C Rodrigo	B. Pass	Azelik
O				Koongarra	Smith Ranch	L-Bar	Swanson	Blizzard
P				Honeymoon	Reno Creek	Jabiluka Potential	Crown Point	Logoa/ Figueira
E				Green Mt	Bison Basin	Dalton	Afaste	Grants/ Church
R				Church Rock	Alta Mesa	Arizon	Sundance	Ben Lomond
A					Wyoming Isl Po	Pumpkin	Arizona Strip R	Narwa Dahr
T					Kiggavik		Yeeliree	Beverly
I					South Texas			
N					Sherwood			
G					Lucky Mc-Eagle			

NOTE: The cost of operating specific uranium properties is known to the specific operator alone although industry organisations estimate costs with a high degree of accuracy. The deposits listed within the cost range are in alphabetical order of their parent company.

Source: Dension (sub.131 Table II)

24 OFFICE OF THE SUPERVISING SCIENTIST

This section reviews environmental protection policies and practices in the Alligator Rivers Region of the Northern Territory. The roles and responsibilities of the Office of the Supervising Scientist of the Alligator Rivers Region and the Northern Territory Government are discussed in some detail. These organisations each have a degree of primary responsibility for the protection of the environment of the Region from the effects of uranium mining. This duplication can be costly.

24.1 Introduction

The Office of the Supervising Scientist for the Alligator Rivers Region (OSS) comprises the Supervising Scientist and his staff, including the Alligator Rivers Region Research Institute (ARRRI) - located at Jabiru - which he also manages. The average staff level of OSS during 1988-89 was 73, comprising 45 at Jabiru, 26 in Sydney and 2 in Darwin.

The Alligator Rivers Region (the Region) is centred some 220 kilometres east of Darwin and comprises an area of about 28 000 square kilometres which includes the catchments of the East, South and West Alligator Rivers, Field and Barron Islands and the territorial sea adjacent to this area. Part of Arnhem Land Aboriginal Reserve is included in the Region, nearly two-thirds of which today comprises Kakadu National Park. The park is made up of three areas (known as Stages) located entirely within the Region, while the Conservation Zone (CZ) is also located in the Region, being surrounded by Stage III of the park (see maps in Section 21).

Under the Environment Protection (Alligator Rivers Region) Act 1978 (Cwth) (henceforth the Environment Protection Act), the Supervising Scientist has overall supervisory, research and co-ordination responsibilities to protect the environment of the Region from the effects of uranium mining, and has supervisory and research functions relating to general mining operations in the CZ.

The Ranger and Nabarlek uranium mines are in the Region but are outside the boundaries of Kakadu National Park, while the Coronation Hill Joint Venture (CHJV) is involved in exploration activity in the CZ.

The Commonwealth has retained ownership of uranium resources in the NT. However, as a result of a 1979 agreement between the Commonwealth and NT Governments, uranium mining in the NT is regulated to the maximum extent possible by the laws of the NT, and comes under the control of the Conservation Commission and the Departments of Mines and Energy and Transport and Works. These organisations are referred to as Supervising Authorities. Working arrangements agreed in 1979 established procedures for consultation between the Supervising Scientist and the Supervising Authorities. The Commonwealth and NT Governments also agreed in 1988 that exploration work at Coronation Hill and at El Sharana would be regulated by the NT authorities on behalf of the Commonwealth subject to the direction of the Director of the Australian National Parks and Wildlife Service (ANPWS).

ANPWS has the prime responsibility under the *National Parks and Wildlife Conservation Act 1975* for the management of Kakadu National Park. ANPWS controls prospecting and exploration activities and the provision of infrastructure in this area. Under the *Environment Protection (NT Supreme Court) Act 1978*, the NT Supreme Court can, at the suit of the Director of ANPWS, the Northern Land Council or the Conservation Commission of the NT, make orders for the enforcement, in relation to uranium mining, of environmental requirements which are contained in Commonwealth and NT laws, and in instruments made under those laws.

24.2 Role and functions of OSS

The role and functions of OSS were set out in the second reading speech of the Environment Protection Act. The following discussion draws on that source as well as information supplied by OSS to this Inquiry.

In 1977, following the tabling of the reports of the Ranger Inquiry, the Commonwealth Government decided to:

- establish a major national park in the Region;
- appoint a Supervising Scientist to co-ordinate environment protection in the Region;
- establish a Co-ordinating Committee for the Region to include representatives of all agencies involved in research and monitoring activities, the mining industry and other relevant bodies;
- set up the Alligator Rivers Region Research Institute to provide a centre for research and monitoring activity;
- develop a uniform national code of practice to apply to uranium mining and milling in Australia; and
- adopt strict environmental controls and standards in relation to uranium mining in the Region.

The basic functions of the Supervising Scientist may be summarised as follows:

- Carry out research on the effects of uranium and other mining operations on the environment of the Region;
- Supervise the implementation of Commonwealth and other environmental requirements which mining developments must meet;
- Develop and promote standards, procedures and measures for the protection and restoration of the environment from the effects of mining operations; and
- Co-ordinate environment protection, research and supervisory activities relating to uranium mining in the Region.

The Supervising Scientist is required to advise the federal Minister on all these matters and performs other functions, consistent with his principal role, in accordance with prescribed instruments. (Examples of prescribed instruments are permits, licences, leases and instruments relating to laws both of the Commonwealth and NT Governments).

The Co-ordinating Committee was intended to be the focal point of the system for protecting the environment of the Region. Its purpose is to consider and reconcile possibly conflicting views and positions of the organisations and authorities operating in the Region.

The role of the Co-ordinating Committee is to provide a forum and a mechanism for these interests and organisations to communicate, consult, consider and reach agreements on the protection of the environment. It is the task of the Supervising Scientist, presiding at meetings of the Co-ordinating Committee, to obtain comprehensive and co-ordinated advice and recommendations which take account of all interests and which have as their primary objective the protection of the environment from mining in the Region.

The Alligator Rivers Region Research Institute is a multidisciplinary research organisation managed by the Supervising Scientist and has extensive laboratory facilities located at Jabiru, which is located within Kakadu National Park. Its role is to provide a scientific basis for developing standards and measures for the protection and restoration of the environment and for assessing the actual and potential short- and long- term effects of mining operations in the Region.

At the time the *Environment Protection Act* came into force in 1978, it was envisaged that responsibility for much of the administration and enforcement associated with environmental protection in the Region would remain with existing authorities under arrangements to be agreed with the NT Government. This approach to setting up OSS was adopted to emphasise the co-ordinating role of the Supervising Scientist as distinct from any suggestion of direction of Government agencies operating in the Region.

The purpose of the Working Arrangements agreed between the Commonwealth and NT Governments (Department of the Chief Minister and OSS 1979, p.3) was to establish procedures for consultation between the Supervising Scientist and the NT Supervising Authorities to ensure that (in part):

- Each Authority involved appreciates its own role and the roles of others;
- ... No Supervising Authority grants an approval or takes any related action in connection with the environmental aspects of uranium mining without consulting and having regard to the views of other relevant Supervising Authorities and the Supervising Scientist where practicable or appropriate; ... and
- All relevant matters are referred to the Co-ordinating Committee having due regard to its role under the *Environment Protection Act*.

The allocation of responsibilities between the mining companies, OSS and the NT Government is set out in the Philosophy of Compliance prepared by the Co-ordinating Committee as summarised below (Co-ordinating Committee for the Alligator Rivers Region 1982, pp.5-6):

The responsibilities inherent in the arrangements to ensure compliance with the regulatory regimes applicable to uranium mining in the Region are as follows:

The mining companies are obliged to carry out their operations in compliance with the requirements of the regulatory regime established for each project (and other requirements generally associated with mining) and to demonstrate that compliance has been achieved.

The Supervising Authorities are responsible under NT law through leases, authorisations, approvals and other legal instruments for the regulatory regimes defining the operational conditions under which mining and processing may take place. They are similarly responsible for undertaking surveillance and monitoring to verify that compliance has been achieved and for directing the companies if necessary to take action to rectify any failure to meet the requirements of the regulatory regime.

The Supervising Scientist promotes and assists in the establishment of regulatory regimes which meet Commonwealth requirements and advises his Minister on the effectiveness with which these are implemented, including any deficiencies he may observe in the regimes in place and in the degree to which compliance is achieved. He also has a major role to conduct research aimed at increasing the understanding of the environment of the Region and how this may best be protected.

OSS stated in its 1988-89 Annual Report (OSS 1989, p.3) that it is required to ensure that Commonwealth Environmental Requirements (ERs) relating to mining activity in the Region are implemented, and that the regulatory arrangements that have been established by the NT Government are sufficient to provide adequate protection for the environment against the effects of mining and exploration operations in the Region.

These requirements have been authorised under the *Atomic Energy Act 1953* in the case of the Ranger Project, which is managed by Energy Resources of Australia Ltd (ERA), and under the NT *Mining Act 1982-85* (Mining Act) for the Nabarlek mining operation conducted by Queensland Mines Ltd (OSS 1989, pp.A85-106). The ERs deal in very broad terms with every likely aspect of environmental concern in the Region and impose substantial constraints on the behaviour of mining companies with respect to the environmental consequences of any actions they take in the course of mining operations.

The relevant NT legislation which covers environmental protection matters at the Ranger and Nabarlek mines is the NT *Uranium Mining (Environmental Control) Act 1979* (Uranium Mining Act). This Act makes reference to the same ERs for which OSS has supervisory responsibility under the *Environment Protection Act*.

Exploration activities at Coronation Hill and at El Sharana are subject to a somewhat less involved set of Environmental Conditions (OSS 1989, pp.A107-10). The NT Department of Mines and Energy (DME) was allocated responsibility for environmental protection in relation to exploration

and associated activities conducted by CHJV under conditions attached to authorisations issued by the Commonwealth Government under the *Lands Acquisition Act 1955*. These authorisations expired at the end of 1989. OSS is required to supervise compliance with these ECs under the *Environment Protection Act*.

24.3 Complaints about the role and activities of OSS

In the course of this inquiry, a series of allegations have been made about OSS and its activities in the Region. They concern:

- overlap of responsibilities between OSS and the NT authorities in regulatory and supervisory functions;
- differences in the interpretation of 'best practicable technology' (BPT);
- deficiencies in research work carried out by OSS;
- poor communications between OSS and mining companies operating in the Region;
- the discriminatory nature of the levy imposed on the output of the Ranger uranium mine; and
- double standards of environmental control imposed on the mining industry as compared with other activities within the park.

These alleged shortcomings are addressed in the following discussion.

Overlap of responsibilities between OSS and NT authorities

This allegation is the most serious since it concerns the fundamental relationship between the parties to the Working Arrangements. As set out in the Philosophy of Compliance paper, the NT Government is responsible for regulating all mining in the Region, while OSS is required to monitor such activity and advise the Commonwealth Government about its implications for the environmental integrity of the Region.

OSS submitted (sub. 59, p.4) that its work is directed primarily towards:

- acquiring an adequate knowledge of the environment and of mining operations and practices in the Region, and of technology used elsewhere applicable to such operations and practices, so as to be able to assess the actual and potential environmental impact of mining in the Region and to advise on BPT for these operations;
- promoting and assisting in the development of standards, practices and procedures for use in mining operations in the Region, and of measures for the protection and restoration of the environment, so that those operations are carried out in accordance with BPT;

-
- providing advice to the Commonwealth on the extent to which the environment is likely to be affected by mining in the Region; and
 - assessing the adequacy with which the environment is protected and restored.

The OSS submission (sub. 59, p.10) sets out the role of the NT Government in the regulation of mining activity in the Region:

The ERs are incorporated in the NT *Uranium Mining (Environmental Control) Act* (Uranium Mining Act) which requires the NT Minister for Mines and Energy in issuing Authorisations under that Act to have primary regard for, but not to give effect to, the ERs ... ;

The NT can legitimately have a flexible approach to the implementation of the ERs and may authorise mining company activities under conditions that conflict with constraints specified in the ERs;

Ranger must comply with both NT applicable law (eg requirements of Authorisations issued under the NT Uranium Mining Act) and the ERs, unless it is impossible or impracticable to do both, in which case it must comply with the NT law.

OSS submitted (sub. 59, p.8) that there was minimal duplication and overlap of monitoring, supervisory and regulatory activities between it and other Government agencies involved, particularly the NT Government.

A recent review of OSS conducted by Professor G H Taylor (Taylor Review) concluded that there was no significant duplication or overlap in the roles of OSS and NT authorities (DASETT 1989, p.31):

The Review does not accept that there has been significant duplication or overlap in the roles of the OSS and NT authorities. If the OSS had not played the role it has, those necessary activities would to a large extent either not have been done or would possibly not have been done well enough to ensure adequate protection of the environment.

DASETT disagreed with the finding in the Draft Report that there are substantial problems in the administration of mining activity in the Alligator Rivers Region due to overlapping responsibilities between OSS and the NT DME (sub. 263, p.13).

Unaccountably, the report does not indicate why, following the transfer of responsibilities currently undertaken by the OSS to such agencies as ANPWS and CSIRO or ANSTO, the new proposed arrangements will overcome or resolve existing problems, when agencies will continue to pursue the same responsibilities as are presently undertaken (sub. 263, p.14).

The differing views on the regulatory and supervisory functions in relation to mining operations in the Region are considered below.

Discussion of regulatory function

ANPWS referred (sub. 248, p.4) to the recommendation in the Draft Report to make it responsible for the interests of the Commonwealth Government in the environmental management of Kakadu National Park. It submitted that it already has the responsibility for the environmental management of Kakadu National Park:

The role of the OSS in relation to Kakadu National Park is solely to ensure that the park, as part of the Region, is protected from the effects of mining. This is a technical role which the OSS was established to fulfil. The Industry Commission may thus wish to consider if it still sees sufficient overlap in the functions of the two agencies to let the recommendation stand. While the ANPWS could encompass the technical role, Government policy has consistently confirmed the need for a separate supervisory authority.

ERA submitted (sub. 57, pp.34-5) that OSS has become heavily involved in regulatory issues:

ERA regards this new-found interest of the OSS in becoming more heavily involved in regulatory issues as unwarranted and the resulting activities to be in conflict with the role of the NT Government.

ERA further argued (sub. 57, p.36) that the NT Government has developed efficient regulatory services that provide the Commonwealth Department of Primary Industries and Energy with the assurance of compliance with the Atomic Energy Act and other legislative requirements.

However, OSS submitted (sub. 128, p.9) that it had always been involved in regulatory issues:

Given that one of its most important roles is to advise the Minister on the adequacy of the NT regulatory regime to ensure environmental protection, and the extent to which implementation of the Commonwealth's own ERs is being enforced by the NT, this heavy involvement could hardly have been otherwise. Such a role is an explicit function of the Supervising Scientist under the Environment Protection Act (s.5(d) and 5(e)(iv)) and to describe it as unwarranted, again shows Ranger's superficial grasp of the role of OSS. It is, of course, a role that the NT could not possess and so can hardly be in conflict with the role of the NT Governments.

OSS views on infringements of ERs by mining companies are set out below (OSS 1989, pp.5, 9):

The NT considers that the flexible approach it is able to adopt to be more appropriate for the regulation of a mining operation. This reflects a real difference in perspective, dictated by their respective roles, of the ERs as seen by the NT and the Supervising Scientist. The Supervising Scientist has no flexibility in the choice of the infringements of requirements he elects to report upon even if the action which infringes a Commonwealth requirement may be legal under NT law. ...

If the Commonwealth wishes to continue to see mining operations in the Region regulated under NT law and at the same time ensure that its requirements are implemented, it may be necessary to amend the existing arrangements to require the Supervising Authority to give effect to Commonwealth advice rather than, as at present, merely to take it into account.

The need for compliance with state and federal regulatory requirements was accepted by ERA in its evidence (transcript p.338). ERA made the following recommendation (sub. 57, p.37) concerning the perceived regulatory role of OSS:

The Supervisory and Assessment Section of the OSS should be disbanded. The regulatory functions, as in other States, are clearly the responsibility of the NT authorities.

Western Mining Corporation Holdings Ltd expressed (sub. 239, p.13) its concern about the proposal to expand the role of OSS:

Moreover, in some cases, such as proposals to expand the role of OSS, already redundant intervention has been highlighted as likely to be duplicated. Such inefficiencies need to be underscored in the Commission's final report.

Discussion of supervisory function

The specific supervisory functions of the Supervising Scientist are set out in ss 5(d) and 5A(d) of the *Environment Protection Act*:

to co-ordinate, and supervise, the implementation, in relation to uranium mining operations in the Region, of requirements of or having effect under prescribed instruments in so far as those requirements relate to any matter affecting the environment of the Region.

OSS pointed out (sub. 128, pp.8-9) that the major purpose of its supervisory function was to be able to advise the Government on the adequacy and effectiveness of environmental protection arrangements in the Region:

There are two matters to be assessed and reported on:

- The adequacy of the regulatory system itself, as established by the NT, to achieve the high level of protection demanded by the Commonwealth; and
- The effectiveness with which that system is being implemented by the NT and complied with by Ranger.

The Review of OSS conducted by Professor G H Taylor (Taylor Review) pointed out that the supervisory role of OSS should be its most central function, supported by the other roles specified in the *Environment Protection Act*. It found that the performance of OSS in this regard was less than satisfactory:

Given the central importance of the role of the Supervisory and Assessment Branch [of OSS] and the wide range of matters to be monitored, there is a need for a program of regular inspections at the various sites as well as a systematic work program to deal with such matters as proposals for changes in operations. These OSS activities must be carried out largely at or near the mine sites. The Review was surprised that the majority of staff of the Supervisory and Assessment Branch, (4 out of 6), are located in Sydney, while the remaining 2 are in Darwin and that the two Darwin officers average only about one day a week each in the field, and have no planned program of inspections. ...

The emphasis seems rather to have been on "regular reviews and assessment of company and NT supervising authority documents" ... While this latter activity is certainly essential, it is difficult to understand how it can absorb as much time as it apparently does. Moreover the obligation to report on the adequacy with which the environment is protected and restored requires a much more active field role. ... The relocation of Sydney-based staff to the NT ... will be consistent with a more significant field role for the Supervisory and Assessment Branch. ... A more active and positive management role in relation to supervision and assessment is advocated (DASETT 1989, p.52).

For all these reasons the management and policy headquarters of the organisation should be located in Darwin, close to other organisations with which they are most concerned, close to the Alligator Rivers Region Research Institute, and close to the environment which is the reason for the OSS's existence (DASETT 1989, pp.101-3).

OSS rejected (sub. 128, pp.10-1), for reasons of cost and relevance, the suggestion put forward by the Taylor Review to relocate Sydney-based staff of the Supervisory and Assessment Branch or indeed any Sydney-based staff to the NT.

ERA stated (sub. 139, pp.16-7) that it did not agree with the comment of the Taylor Review that the supervisory role of the OSS is or should be its central function:

This is duplication of the NT supervising authority's role and it is clearly evident from 10 years of operation that the NT authority has performed satisfactorily.

The Australian Mining Industry Council also referred (sub. 29, pp.40-1) to the duplication of the supervisory function by OSS and the NT authorities.

Different approaches in interpreting Best Practicable Technology

Environmental Requirements 19 and 17 define (OSS 1989, pp.A90, A101) the approach to be taken in developing mining operations at Ranger and Nabarlek:

Taken as a whole, and in their component parts, the plant and the mine shall be designed, and the mining, milling and related operations within the Ranger Project Area shall be carried on, in accordance with BPT.

BPT in relation to mining operations at Ranger and Nabarlek is defined (OSS 1989, pp.A93-4, A104-5) in identical ERs as follows:

'Best practicable technology' is that technology from time to time relevant to the Ranger Project which produces the minimum environmental pollution and degradation that can reasonably be achieved ... [emphasis added].

ERA submitted (sub. 57, p.39) that "BPT should be the primary environmental requirement as it is a principle requirement in all the legislation and agreements".

OSS submitted (sub. 128, p.23) that in placing major emphasis on BPT as the principle requirement in legislation:

Ranger is expressing a wish that ER 19 should override the other ERs. Attorney General's advice is that it does not.

OSS referred (OSS 1989, p.7) to its approach to environmental control, indicating that the aim of such regulation should be the achievement of zero observable biological change in the aquatic ecosystem.

The Taylor Review queried (DASETT 1989, pp.56-7) the OSS approach to BPT, pointing out that it is not always possible to separate cause and effect with respect to environmental pollution:

One of the basic principles underlying any effort in the production of standards, practices or procedures is that of BPT, which is defined in the environmental requirements for both the Ranger and Nabarlek operations. Inevitably there will be disputes over what constitutes BPT for any given circumstance.

A basic issue when considering BPT is to agree on what can be accepted as 'the minimum environmental pollution and degradation that can reasonably be achieved' (ER44, Ranger Environmental Requirements). The OSS believes that BPT means that the aim should be, as far as is reasonable, to achieve zero detriment in the aquatic ecosystem. Further, since any observable effect on an aquatic ecosystem cannot confidently be demonstrated not to be an undesirable effect, all observable effects are to be avoided. While such an aim is admirable, the Review is concerned that it is likely to be difficult or impossible to achieve in practice since cause and effect cannot always be related in the presence of a variety of environmental impactors. It would be sensible, therefore, for the OSS to reconsider its approach to this question, which has been central to a number of contested issues.

Alleged deficiencies in research work undertaken by OSS

Several matters relating to research being carried out by OSS were put forward by mining companies and the NT Government. Mining companies expressed concern about the following matters:

- duplication of research functions among different agencies;

-
- lack of effective research management; and
 - lack of relevance of research to mining operations.

ERA made the following recommendations (sub. 57, p.37) for the reorganisation of research required to address satisfactorily the protection of the environment in the Region:

- research requirements should be carried out by the CSIRO, ANSTO and other existing expert groups;
- research should be funded on a user-pays basis, project by project;
- the ARRRRI should be maintained as a field station for research programs supervised by expert scientists selected on a project basis from the major institutions;
- the administration of the Environment Protection Act should be transferred to ANSTO as they already provide an Australia-wide service to industry and government;
- the existing Co-ordinating Committee should be abolished; and
- the Sydney office of the OSS should be closed as there appears to be no justification for its continued existence.

While Pancontinental Mining Ltd submitted (sub. 181, p.3) that OSS should continue to exist, it stated at the Draft Report Hearing that it would be happy to see the research function of OSS transferred to either CSIRO or ANSTO (transcript, p.2524).

The NT Government referred (sub. 226, p.7) to the recommendation in the Draft Report on the use of an independent scientific body like CSIRO in the environmental impact assessment process, and stated that CSIRO's stature as a detached professional body has been destroyed by their biased and unprofessional handling of environmental investigations at Coronation Hill. Thus the NT Government and the mining industry have opposing views on the role which CSIRO could play in the conduct of environmental research in the Region.

It is not possible for this inquiry to assess the technical merits of the claims made by the mining companies concerning OSS research. However the research role and performance of OSS were examined in detail in 1989 by the Taylor Review, while research administration was investigated by the Auditor General and the House of Representatives Standing Committee on Environment, Recreation and the Arts. The conclusions of these investigations are set out below, together with relevant comments by OSS.

Duplication of research functions among agencies

ERA submitted (sub. 57, p.33) that OSS was duplicating the functions of other agencies which are active in the research field. OSS stated (sub. 128, p.6) that at the time its research program was set up, care was taken to ensure that there was no overlap between OSS and ANSTO.

OSS referred to the submission (Australia, Parliament 1987) it made to the Committee set up to review, *inter alia*, the objectives and programs of the AAEC and their appropriateness for the new ANSTO institution:

The AAEC [research] program has tended to concentrate on areas where it has the specialised expertise in certain facets of the mining and milling operations as potential sources of environmental impact and on measures for reducing these sources; the ARRRI, on the fate of released material once it leaves the mine site and the mechanisms by which it can lead to environmental change and possible detriment.

Lack of effective management of OSS research

The Taylor Review made an overall finding (DASETT 1989, p.30) that it was satisfied that the OSS research role in practice has been in accordance with its statutory requirements. However the Review was critical (DASETT 1989, pp.40, 46-7) of the research performance of OSS:

Long delays between the original data collection and the availability of results has seriously reduced the utility of OSS work which has been made available. Even more important is the apparently large backlog of work which has not been written up or results which have not even been analysed. ... In any research organisation but especially one that claims to be goal-oriented this is unacceptable. If the research results are unavailable the work might as well not have been done. Immediate management action is required to ensure that current research results are promptly published and not abandoned when staff leave. This tardiness in publication has been repeatedly criticised during the Review. ... There is little doubt that the OSS research could be better planned and focussed.

The lack of a research plan seems to have been a major factor in reducing the impact and effectiveness of OSS research. In some cases those carrying out research have not even been aware of related research being funded, also by OSS, at the same time. Much of the criticism of the relevance of the OSS's research would have been averted if there had been a clear plan of what research was being undertaken and planned for the future. Participation by mining companies (and other expert individuals) in the discussions leading to a formal agreed plan would also remove any expectation that the OSS would conduct research to assist them in their day to day operations.

In 1989 the Auditor General carried out an audit of OSS research administration, as a follow up to an assessment it carried out in 1987. The key findings of the Auditor General (Auditor General 1989, p.i) are set out below;

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- OSS should formalise the development and approval processes for internal research projects and issue guidelines for the use of staff;
 - Policy should be developed for monitoring the progress of research projects; and
 - More prompt publication of reports on the results of research would enhance the credibility of the research undertaken by OSS, and action should be taken by OSS to reduce delays in the publication process.

The Auditor General's Report was reviewed by the House of Representatives Standing Committee on Environment, Recreation and the Arts which reported (Australia, House of Representatives Standing Committee on Environment, Recreation and the Arts 1989, pp.5-6) as follows:

- The Committee does not regard the deficiencies noted by the Audit as significant;
- There is no evidence to suggest that the OSS is undertaking inappropriate or irrelevant research nor is there any evidence to suggest that the research program is being poorly managed; and
- The Committee considers that there is no evidence to suggest that the OSS is in any way deficient in translating research into information that can be used by the regulatory authorities.

The Committee noted that the auditors did not consider the appropriateness or relevance of research projects, did not comment on the subject matter or adequacy of the science carried out by the OSS, and did not question the decision making process involved in deciding whether or not research results would be published (Australia, House of Representatives Standing Committee on Environment, Recreation and the Arts 1989, p.7).

Lack of relevance of OSS research to mining operations

OSS is required under s.5(a) and s.5A(a) of the Environment Protection Act to:

devise and develop programs for research into, and programs for the collection and assessment of information relating to, the effects of uranium mining operations on the environment in the Region.

In particular, s.5(c)(i) and s.5A(c)(i) of the Act require OSS to:

devise and develop, and to promote and assist in the devising and development of, standards, practices and procedures in relation to uranium mining operations in the Region for the protection of, or in so far as those standards, practices and procedures affect, the environment in the Region.

OSS was firmly of the view (transcript pp.1320-1) that its role did not extend to carrying out work which was the responsibility of the mining companies themselves:

We are not doing work which is going to help them manage their tailings, to design tailings dams, to design seepage collection systems The manner in which you might modify a plant process in order to reduce its impact on the environment - the engineering aspects - ANSTO do. We have no chemical engineers doing research in this area. We never aspired to. It was agreed by the mining companies that we should not. ... Our job is to do work on the environment, on the ecosystems, to ensure that they are able to be protected by controlling the manner in which you release toxic waste to the environment and to assess ... that the environment is or is not being damaged, the aquatic environment in particular. Now that is a major part of our work.

OSS submitted a 6-page list of standards, practices and procedures which it claimed are of immediate use to Ranger in its operations (sub. 128, p.8). However, the Taylor Review found (DASETT 1989, p.57) that OSS had failed to produce adequate and appropriate information which could be used by the mining industry:

The OSS has listed a number of analytical techniques which, they submit, are of value in environmental protection. While not doubting their claim, the Review is concerned that the OSS has not been able to produce a similar list of standards, practices and procedures for protection of the environment in the Region in relation to mining operations in the Region. For example it appears that the OSS has, to date, done only minimal work on such topics as seepage control, tailings management, spray evaporation, rehabilitation, and revegetation. The lack of a well directed, coherent research plan ... has no doubt contributed to the lack of standards produced.

The Taylor Review made a recommendation (DASETT 1989, p.58) that OSS publish quantified standards and explicitly defined practices and procedures for those mining and exploration operations which have potential for adverse environmental effects.

Poor level of communications between mining companies and OSS

ERA submitted copies of recent correspondence with OSS on technical aspects of seepage from water storage dams at the Ranger minesite. These are included in Volume 4, Section 9 and indicate the extent of the deterioration in the relationship between OSS and ERA.

OSS submitted (sub. 128, p.17) that there were several possible reasons behind the complaints made against it by the mining companies and the allegations of poor communications between them and OSS:

There can be no doubt that a campaign to have the OSS disbanded exists within the mining industry, but it would be simplistic to ascribe the reason solely to the [uranium] levy. There are possibly three basic reasons why the industry would like to see the OSS abolished:

- concern at over-regulation of the mining industry;

- concern that the environmental objectives and standards and level of company performance expected by the OSS may be more demanding than those of the NT DME; and
- concern at the inequity and size of the levy on uranium exports and the fear that this may spread to non-uranium mining operations in the Region.

Discriminatory levy imposed on Ranger mine output

The Federal Government first imposed a duty on the export of uranium concentrate from the Region in April 1980. A summary of the charges which have been imposed on uranium exports is set out below.

Table 24.1: Uranium export levy

Date of effect	Levy (\$ per kg of yellowcake)
April 16, 1980	0.11
August 19, 1986	0.80
September 15, 1987	1.02
August 23, 1988	1.15
July 1, 1989	1.30

Source: Australia, House of Representatives 1980, 1987, 1988;
Explanatory Memorandum 1989.

Between 1980 and 1987, it was the intention of the Government in setting the levy to recover about 50 per cent of the special costs of environmental monitoring and research activities by the OSS associated with uranium mining operations in the Region (Australia, House of Representatives 1980, p.883; 1987, p.271).

In 1988, the Government announced that the levy of \$1.02 per kg which came into effect during 1987 was intended to recover about 75 per cent of those costs, (Australia, House of Representatives 1988, p.141). The explanatory memorandum to the 1989 amendment which increased the levy to \$1.30 per kg contained the following statement (Explanatory Memorandum 1989):

The increased rate of duty ... reflects the Government's position that the costs associated with protecting the environment from the potential adverse effects of uranium mining should be borne, as far as is practicable, by the industry carrying out that mining activity, and not the ordinary taxpayer.

OSS took the view that the funds raised by the levy were not solely related to the cost of its operations in the Region (sub. 59, p.7). OSS stated in evidence (transcript p.1301):

I do not believe it should be, nor was it in the original statement, regarded as a levy which is struck solely to pay for the operations of the OSS. The Government has other expenditures in the Region resulting from the presence of mining in the park and expenses concerned with environmental protection.

ANPWS submitted (sub. 248, p.4) that the charges levied on the Ranger uranium mine are specifically for the costs of protecting the Region from the effects of mining:

There can be no justification for extending charges for that purpose to those who are not involved in mining. All adult visitors to Kakadu National Park are required to pay a park use fee, which contributes to the general costs of managing the park, including environmental protection.

ERA submitted (sub. 57, p.31) that the levy might appear to be an example of the "user-pays" principle, but that none of the customary buyer-seller relationships apply. ERA also stated (sub. 57, pp.28-9) that because OSS had failed to produce any practices and procedures of value to the environmental management of the Ranger mine, ERA has had to bear the additional costs of having to develop those standards, practices and procedures relevant to environmental management and rehabilitation.

The discriminatory nature of the levy was discussed (sub. 57, pp.25-6) by ERA in its submission:

The levy is discriminatory, in defiance of the accepted principle of equity in taxation. The levy is restricted to uranium exports from the Region. It does not apply to other exports from the same Region nor does it apply to uranium exports from elsewhere in Australia.

ERA put forward (sub. 57, p.36) the following recommendation concerning the levy:

ERA recommends the removal of the duty levied on the export of uranium concentrates from the Region. Not only is the levy discriminatory, but it imposes a significant and rapidly increasing cost burden on ERA, without regard to the extreme competitiveness of the international market for uranium. Removal of the levy would not impact on the protection of the environment, provided supervisory arrangements were re-organised.

This recommendation was also supported by AMIC (sub. 229, p.40).

Pancontinental Mining Ltd submitted (sub. 181, p.3) that the uranium export levy should be abolished as "it is indeed a totally inappropriate method of obtaining funds to support the OSS". It stated that the day-to-day operations of OSS "should be funded through general revenue, and specific projects (of relevance to specific issues at specific operations) should be jointly funded by the Commonwealth Government and the mining company as a result of a mutually agreed arrangement".

Double standards of environmental control

CHJV submitted (sub. 27, p.19) that it has been subjected to much more stringent requirements compared to other activities in the Region:

The CHJV since 1986 has witnessed many examples of double standards in relation to its activities compared to those of the ANPWS and the OSS. They bring into question the need for many of the requirements imposed on the CHJV. Examples of where the Government bodies are not complying with the same standards demanded of the CHJV range from the relatively minor failure to properly dispose of rubbish by the OSS to the more serious which

includes major erosion caused by the construction or upgrading of roads and tracks which have involved the indiscriminate clearing of large areas of land and fording of the South Alligator river and its tributaries. These have been done by both the ANPWS and by buffalo catchers working on contract for the ANPWS. Conversely, CHJV's access to its leases has been rigorously monitored and has been primarily limited to existing roads and tracks.

OSS agreed (transcript p.1314) that while the mining companies were subject to stringent examination, other sources of pollution in the Region were not being subjected to a similar degree of control:

... the other sources of contamination are buffaloes ... road making, the presence of tourists in the town [Jabiru]. They are not being monitored to the same extent, that is quite true, except the buffaloes are being eradicated slowly.

While the *Environment Protection Act* is concerned with the Commonwealth Government's responsibility for uranium mining in the Region, the Taylor Review indicated (DASETT 1989, pp.35-6) that the Region's ecosystem is affected by environmental hazards from other sources, which include:

- the presence of feral animals, especially buffalo, but also pigs, cats, horses and other animals;
- the spread of most exotic weeds, especially salvinia and mimosa;
- fire management;
- recreation and tourist activity;
- the presence of Jabiru township;
- the use of insecticides;
- pastoral activities; and
- the activities of collectors (eg of rare birds).

The Taylor Review referred (DASETT 1989, p.11) to a widely held view which contrasts the strong emphasis on controlling pollution from mining operations with the relative lack of interest in pollution produced by other sources in the Region:

The impact of released mine wastes from the Ranger mine site has been negligible. The effect of run-off water from the project has been barely detectable. [However], all fertilizer, sewage and refuse generated by the 1400 Jabiru residents and the many visitors to Kakadu National Park (totalling 600 000 person days per annum) are released into the Park environment. The impact of these nutrients on the flood plain has not been evaluated. Eutrophication of billabongs with resultant oxygen depletion and mass mortality of aquatic life is a significant potential impact on the Park.

ANPWS has overcome many of the worst effects of tourism (noise pollution, litter and broken bottles around billabongs, car tracks through soft ground and over-fishing) but at the expense of an increasingly intrusive park infrastructure and road network.

The need to take account of all impacts on the ecosystem in addition to that of mining, was raised by the Taylor Review (DASETT 1989, p.12) in the following terms:

In assessing the impact of mining a whole range of other changes and pressures must be taken into account, since the impacts of mining are modified by these other changes. For this reason the OSS must interact, cooperate and coordinate its activities with other monitoring and research bodies having in aggregate a wider range of interests and broader charters than the OSS alone. While the Review does not formally recommend how such interaction should occur, it suggests that the Minister initiate steps to coordinate all environmental protection activities in the Region.

Recommendations for more stringent control of the environmental impact of various activities in the Region were made (Australia, Parliament 1988, p.ix) by the Senate Standing Committee on Environment, Recreation and the Arts:

- The OSS should be given a clearly defined and on-going responsibility to monitor the environmental impacts of Jabiru on the Park ecosystems;
- In future all proposed developments in Jabiru, and in other parts of Kakadu National Park, should be subject to an environmental evaluation, as stipulated in the Park plan of management and required under certain circumstances by the *Environment Protection (Impact of Proposals) Act 1974*; and
- No additional population centre should be developed in Stages 1 and 2 of Kakadu National Park and that any proposal for a tourist development in Stage 3 of the Park should be subject to a stringent environmental impact study

24.4 Conclusions

The arrangements set up by the Commonwealth Government for the protection of the environment of the Alligator Rivers Region - part of which comprises Kakadu National Park - from the effects of uranium mining are quite complex and contain the seeds of their potential failure. The evidence received in this inquiry indicates that the administrative arrangements, which involve laws made under both Commonwealth and NT jurisdictions, have in fact failed.

Two Commonwealth agencies have responsibilities in the Region. Under the *National Parks and Wildlife Conservation Act 1975*, ANPWS has developed a management plan for Kakadu National Park which it administers on behalf of the Commonwealth Government. OSS is responsible under the *Environment Protection (Alligator Rivers Region) Act 1978* (Cwth) for protecting the environment of the Region as a whole from the effects of mining, and 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 Region has been assigned to the NT Government under a 1979 agreement between the Commonwealth and NT Governments.

Three NT agencies function as Supervisory Authorities with respect to mining in the Region, the Conservation Commission, 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.

There would be no problem with these arrangements if OSS merely had an advisory role, leaving the Supervisory Authorities responsible for supervision, regulation and enforcement. However, the legislation under which OSS functions stipulates that OSS has the responsibility to advise 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.

A further legislative consideration is that 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 of the Alligator Rivers Region was set up to resolve by discussion any differences of view 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 the intention of the legislators that OSS 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 NT cannot confidently exercise all the powers of a regulatory authority. This arises since OSS can and does intrude into the regulatory process by having views differing from those of the Supervisory Authorities on important aspects of environmental protection, particularly by adopting different interpretations of Environmental Requirements.

This state of affairs can place the mining companies in an untenable position, where there is no clear authority and where there is uncertainty as to what is the most appropriate course of action. If they abide by directions issued by the NT Supervisory Authorities, they can be criticised by OSS. Consequently there has been a number of ongoing battles between OSS, the mining companies and the NT authorities. Examples of the extent to which communications between OSS and the mining companies have sunk are set out in Volume 4, Section 9.

The following recommendations for overcoming these problems provide different management regimes within the outer perimeter of Kakadu National Park (which includes the Ranger, Jabiluka and Koongarra mining lease areas and four other small areas which are not within the boundaries of the Park) and in the remainder of the Region:

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- Abolish the co-ordination role of OSS as it relates to the protection of the environment of the Region from the effects of mining operations;
 - Transfer the supervisory responsibilities of OSS to ANPWS insofar as they relate to Kakadu National Park;
 - Make ANPWS responsible for the environmental control of all sources of pollution originating within the outer perimeter of the Park;
 - In the interests of equity, apply the same standards of environmental quality to all sources of pollution within the outer perimeter of the Park as those currently imposed on mining operations in the Region by means of Environmental Requirements;
 - Again in the interests of equity, apply the same level of environmental cost recovery to all sources of environmental pollution within the outer perimeter of the Park, including Jabiru township and tourists, as is currently applied to uranium mining operations in the Region;
 - Renegotiate the Working Arrangements between the Commonwealth and NT Governments to clarify the appropriate regulatory responsibilities of the NT Government for mining and exploration activity both within the outer perimeter of Kakadu National Park and in the remainder of the Region. (The interpretation of Best Practicable Technology should continue to be the responsibility of the NT Supervisory Authorities acting under NT law);
 - Transfer to ANPWS the OSS responsibility for collecting data on the effects of mining and exploration activity on the environment of the Park, and expand the scope of this function to relate to the effects on the environment of the Park of all sources of pollution originating within the outer perimeter of the Park;
 - Transfer to the NT Government the OSS responsibility for collecting data on the effects of mining and exploration activity on the environment of the Region (excluding the area within the outer perimeter of the Park); and
 - Transfer the OSS responsibilities to carry out research and to develop standards, practices and procedures for the protection of the environment from the effects of mining operations either solely or jointly to research organisations such as CSIRO or ANSTO which are already experienced in various aspects of the relevant research requirements.

It is not the function of this Inquiry to comment on the technical expertise of OSS in research matters. However, the discussion shows that the Taylor Review had reservations about some aspects of OSS research. These comments should be addressed by the organisation(s) which take over OSS research responsibilities.

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