THE ENFORCEMENT OF REHABILITATION CONDITIONS IN MINING AND PETROLEUM TENEMENTS

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THE ISSUE

Mining has for centuries endured the reputation for being one of the most environmentally detrimental activities undertaken by humankind. The responsibility for this may lie in several directions. Whether it lies with government, the entrepreneur or any other group within society, the part played by the legal system is crucial in identifying, refining and ultimately enforcing that responsibility. Although the legal system cannot itself ensure environmental security, no policy is capable of achieving its objectives without an effective legal structure.

This paper seeks to achieve four objectives. The first is to describe how the policy of mine-site rehabilitation has evolved over the past 20 or so years. The second is to examine the legal framework for mine-site rehabilitation. The third is to identify the legal mechanisms presently used to achieve mine-site rehabilitation in the several Australian jurisdictions. The fourth is to anticipate the future directions that liability for mine-site rehabilitation is likely to take. In this exercise, policy, instruments for achieving policy and legal liability flowing from the use of these instruments are very much interrelated, both conceptually and in practical terms. In this respect mine-site rehabilitation is very much a microcosm of environmental law at large.

THE POLICY OF REHABILITATION

Historical

Sites left abandoned and derelict as a result of defunct mining operations are no doubt as old as the activity of mining itself. It is the scale of mining, the potentially adverse consequences for the environment, the increasing sensitivity of the community and the changing social and political values associated with this heightened consciousness which over the past 25 years have transformed the relationship between mining and environment and over the past decade have given rehabilitation something of a specific focus in this relationship.

The environmental consequences of mining operations have always been a matter of 'interest' within the legal system. The word 'interest' is used advisedly, in the sense that the common law recognises the interest that the user of land and related resources has in the way in which other, usually adjacent, users of land and related resources exercise their reciprocal rights of use. It has traditionally been the function of the common law

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to protect the interest of an individual in this respect. The protection of the public interest in matters environmental has been the exception rather than the rule for the common law.

Until the second half of the twentieth century, legislation intervened only intermittently to protect the environment from pollution and other forms of physical, biological and aesthetic degradation. For example, it was quite clearly the policy of the early mining legislation in Australia to promote the development and exploitation of Australia's mineral resources. Indeed the legislation was structured in such a way that consideration of the environmental effects of mining operations might well have been regarded as irrelevant as a matter of law. This was no accident. Priorities have now changed.

It is against this background that environmental law in relation to mining has developed over the past two or three decades. First, legislation designed to reduce or prevent water, air and noise pollution was enacted. The next stage was the introduction of legislation providing for environmental impact assessment at large or as part of the land-use planning process to enable or require the environmental implications of particular projects to be assessed. The third stage was the incorporation of environmental perspectives specifically within the decision-making processes providing access to minerals and authorising mining operations. The final stage is the formal recognition of the power and then the obligation to provide for rehabilitation of mined sites. It is possible to consider liability for mine-site rehabilitation on its own terms, but the evolution of the environmental legal system in Australia indicates that legal obligations in respect of rehabilitation need to be considered within this wider framework.

United Kingdom

Responses in other jurisdictions have not been so very different. Mining in the United Kingdom, particularly for coal, has had a long history. For hundreds of years the legal system relied upon the common law through liability in trespass and nuisance, through rights of support and liability for subsidence, and through the riparian doctrine of water quality. The common law responded to problems; it did not prevent them. It was not until the second half of the twentieth century that Parliament took a more positive interest in mining operations by anticipating some of the problems.

In 1951 the Ironstone Restoration Fund was established. Contributions to the fund were payable by operators and the minister, and payments were made out of the fund to operators who carried out reclamation and restoration work on the land.[1] This scheme was discontinued in 1985.[2] The Coal-Mining (Subsidence) Act 1957 requires the coal industry to execute remedial works to repair damage and restore land in consequence of subsidence due to coal mining. The Mines and Quarries (Tips) Act 1969 requires tips to be made and kept secure. More recently,

1 Mineral Workings Act 1951 (UK), ss.2, 4, 8 and 9.
2 Mineral Workings Act 1985 (UK).

s.3 of the Opencast Coal Act 1958 was amended in 1990 to require consideration of environmental and conservation matters in formulating proposals for opencast coal operations and for restoration of land affected by such operations. The Petroleum Act 1987 provides comprehensively for the abandonment of offshore petroleum installations and pipelines.

The protection of the environment and the rehabilitation of mined sites in the United Kingdom are now addressed principally through the planning system. For the purposes of the Town and Country Planning Act 1990[3], mining operations are development. There is a specific power to include 'restoration' and 'aftercare' conditions in a grant of planning permission[4] and a general power to order the discontinuance of mineral working, including restoration and aftercare conditions, where the interests of proper planning (including amenity) make it expedient.[5] Provision may be made for compensation in limited circumstances.[6] The mechanisms for enforcement include the power conferred upon the local planning authority to enter the land, take the steps required and recover the expenses incurred as a simple contract debt in any court of competent jurisdiction.[7]

New South Wales

In 1973, New South Wales, first in Australia, incorporated in its mining legislation specific reference to environmental considerations and the need for mine-site rehabilitation.[8] By this time the State Pollution Control Commission was already responsible for administering water, air and noise pollution legislation. The Environmental Planning and Assessment Act 1979 extended the scope of planning and introduced environmental impact assessment into the land-use aspects of the natural resource planning system.[9]

Thus by 1980, New South Wales was able to cope on a reasonably comprehensive basis with the environmental implications of mining operations in a way that could take account of the need for mine-site rehabilitation. An assessment at that time of the functions of the State Pollution Control Commission, particularly in relation to coal mining, reached this conclusion:

> The Commission's administration of its control Acts has hitherto been directed at controlling potential air, water and noise pollution and environmental impacts during mine operation. The majority of problems encountered in the operating phase can be solved with current technology once the source and nature of the problem are identified. However, with the massive expansion in coal development and potential disturbance of large areas of land, the Commission is becoming increasingly concerned with long-term environmental impacts. The emphasis is on identifying potential problems and collaborating with industry and other government authorities in finding solutions. The Commission's view is that successful rehabilitation is the main factor in controlling long-term air and water pollution

3 Town and Country Planning Act 1990 (UK), s.55(1) and (4).
4 Ibid. Sch.5, para.2.
5 Ibid. Sch.9.
6 Ibid. Sch.11.
7 Ibid. s.178(1) and (6).
8 Mining Act 1973 (NSW), ss.117–120; Coal Mining Act 1973 (NSW), ss.93–96.
9 Environmental Planning and Assessment Act 1979 (NSW), ss.5 and 111.

> from coal mining activities. In the Hunter Valley success depends primarily on developing an environment conducive to the conservation and efficient utilisation of precipitation by vegetation. Long-term pollution control, and almost all potential types of post-mining land use, are dependent upon successful rehabilitation.[10]

New South Wales has continued to develop its policy of rehabilitation over the past ten years, and other States have adopted either a similar approach or a much more detailed policy for mine-site rehabilitation.

Commonwealth Policy

Although it has no direct responsibility for the use of land or land-related resources in the States, the Commonwealth sees mine-site rehabilitation as part of its policy on ecologically sustainable development.[11] One of the general principles underlying ecologically sustainable development is the integration of economic and environmental goals in policies and activities.[12] Integration is seen as the method of achieving economic growth and environmental protection simultaneously. Although this is not possible in all circumstances, it is, at least in terms of the Commonwealth's proposed range of options, an alternative worth serious consideration.[13]

Such a process of integration involves 'partnership'. Thus, 'promoting ecologically sustainable development requires cooperation between governments, industries, unions and conservation interests, and the support of the community generally, if it is to be truly effective'.[14] Partnership in this sense will be difficult to achieve. Since the present environmental legal system in Australia tends to encourage a conflict of interest among the participants, any system which reduces the potential for conflict should, in theory at least, produce better-informed and more clearly directed decision-making.

The Commonwealth recognises that 'the process of exploration, mining and minerals processing inevitably involves some, at least transient, environmental and ecological impacts and changes'.[15] These impacts and changes, at least to the extent that they are transient, can be reduced and perhaps eliminated by proper management. Among the wide range of issues raised by this approach is the use of incentives as a mechanism for environmental protection and mine-site rehabilitation.

Much of the present environmental legal system in Australia is driven by public regulation and government intervention. The Commonwealth implies in its comments that alternative methods might be more effective. Accordingly, careful consideration should be given to:

> The appropriateness of the current incentive structure (or lack of structure) for mine-site environmental management, including rehabilitation, and the usefulness of different

10 J.C. Hannan (ed.), *Environmental Controls for Coal Mining* (Australian Coal Association and Earth Resources Foundation, 1981), 46.
11 Commonwealth, *Ecologically Sustainable Development — A Commonwealth Discussion Paper* AGPS (1990).
12 Ibid. 3–4.
13 Ibid. 4.
14 Ibid. 12.
15 Ibid. 32.

> market/regulatory instruments to achieve such management, particularly given that the environmental impact of mining is generally localised — for example, the imposition of an environmental bond or an adequate assurance at a project's commencement to finance future rehabilitation if developers fail to meet standards set.[16]

Industry Commission Report

It is no coincidence that the Industry Commission has taken up this challenge in its recent investigation into mining and minerals processing in Australia.[17] This wide-ranging investigation clearly acknowledges the crucial role of environment in mining and minerals processing. First of all, the environment itself is the source of the industry's raw material. Secondly, the environment bears the brunt of the physical, biological and aesthetic impacts of these activities. If it is easy to identify the costs of the intermediate stages of extraction and processing, it is difficult to identify the costs associated with the use of the environment as the source of the raw material and as the recipient of any adverse impacts.

The Industry Commission takes a wide view of 'environment' by identifying the need not only for environmental management at large but also for environmental management in the narrower sense of mine-site rehabilitation. Thus, on the one hand, 'in the first instance an efficient use of environmental services should be sought through the allocation of property rights and the consistent application of the user-pays principle to mining and non-mining activities',[18] while on the other, 'once mining is complete and modern rehabilitation techniques have been applied to stabilise former mine-sites, the surface will in many cases be returned to (and in many cases represent an improvement on) its former productive state'.[19]

The Industry Commission not only acknowledges the general need to protect environmental values and the more specific need to rehabilitate mine-sites; it also suggests a wider range of legal mechanisms to achieve these objectives. These mechanisms are characterised in three ways: those that are market-oriented; the use of command-and-control systems; and effective monitoring devices. Command-and-control systems involve the relatively traditional mechanisms of the creation of standards and the prohibition of activities inconsistent with these standards. Market-oriented mechanisms have recourse to legal liability, the use of subsidies, the imposition of effluent charges, and the transferability of permits.[20] The view of the Industry Commission is:

> 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 upon the particular interaction between a mining-related project and the environment.[21]

16 Ibid. 33–33.
17 Industry Commission, *Mining and Minerals Processing in Australia*, 4 vols AGPS (1991).
18 Ibid. vol.3, 182.
19 Ibid. vol.1, 124.
20 Ibid. vol.3, 174–176, 189–197.
21 Ibid. vol.3, 199.

If the Industry Commission correctly reflects the views of the mining industry,[22] then the community at large, acting through the industry, has responsibility for managing mining operations in a way that ensures the protection of environmental values, and this includes rehabilitation of mined sites. On the other hand, the methods of achieving this objective are less clear and careful consideration should be given to market-oriented mechanisms as well as to the more traditional public regulation and government intervention.

THE LEGAL FRAMEWORK FOR REHABILITATION

The Functions of the Law

The legal framework for mine-site rehabilitation reflects the technical nature of operations for mineral development. The process of development comprises three distinct stages. The first is the pre-operational stage. This involves, apart from any preliminary prospecting or exploration activities, acquiring rights of access to the resource, planning the technical, financial and commercial aspects, and preparing detailed work programs. The second stage is the productive stage of mining or extraction. The third is post-operational: restoring and rehabilitating the site to ensure that it reflects its condition before the commencement of operations.

Whatever the environmental consequences of mining, some are limited to the site itself while others affect a wider area. One of the purposes of the pre-operational planning stage is to anticipate these environmental consequences and avoid those that are adverse. Even if the operations are carefully planned by anticipating the environmental consequences, it is unlikely that all consequences will be foreseen or the manner of their impact fully anticipated. This would suggest the need for flexibility in any system of regulation to oversee or monitor the operations from time to time.

The process of mineral development depends upon the nature of the mineral, its location and the manner of its extraction. Petroleum production is different from coal production and opencast mining is different from underground mining: quarrying displays certain characteristics not shown by other processes; onshore developments are quite different from offshore operations. Environmental consequences, either site specific or wider, can differ markedly. Does the law respond to these different circumstances in the same way? Or does it recognise the differences?

Without recognising all of these distinctions, the law performs four distinct functions in relation to mineral development:

(1) It provides access to the resource to be mined.
(2) It authorises the use of land, water, air or related resources as part of the infrastructure for these operations.
(3) It restricts or eliminates pollution of soil, water and air as a direct result of these operations.

22 Ibid. vol.1, 99; vol.3, 180.

(4) It provides for the reclamation, restoration and rehabilitation of the site and of the surrounding environment after operations have ceased.

Environmental impact assessment is part of the first function. The second involves planning permits, water permits and permits to dispose of waste of one kind or another. The third is largely the enforcement of environmental obligations created directly by legislation or by conditions included in these permits. The fourth involves the creation and enforcement of obligations designed for a particular purpose. These functions are interrelated. In particular, the policy of rehabilitation has legal effect not only through obligations to rehabilitate but also by reason of environmental obligations at large.

General Liability for Environmental Quality

Each of the jurisdictions in Australia has legislation that performs these four functions. The law in each jurisdiction is neither uniform nor consistent. Environmental impact studies or assessments may be required by legislation of general application[23] or as part of the decision-making processes under the mining legislation.[24] Additionally, interference with the surface of land is a use of land for planning purposes.[25] Thus a planning permit or its equivalent is, in the absence of a contrary provision, required for this aspect of mining functions.

This is so in Victoria and Tasmania.[26] In Western Australia a town planning scheme must be taken into account but it does not operate to prevent the grant of a mineral development instrument.[27] The legislation in New South Wales gives precedence to mining-related conditions, including those to rehabilitate, imposed under the mining legislation.[28] In Queensland a mineral development instrument itself authorises a use for the purposes of the planning legislation.[29]

The legislation with respect to environment protection and pollution control is likewise different in each jurisdiction. In Victoria, Tasmania and Western Australia there is legislation dealing with environment protection at large.[30] In New South Wales, Queensland and South Australia each aspect of potential or actual environmental degradation is covered by its own legislation.[31] The constitutional restrictions upon the legislative competence of the Commonwealth produce an even more dis-

23 E.g. Environment Effects Act 1978 (Vic.); Environmental Protection Act 1986 (WA), ss. 38 and 40.
24 E.g Mining Act 1980 (NT), s.58(6) and (7); Mineral Resources Act 1989 (Qld), s.7.21.
25 See generally D.E. Fisher, *Natural Resources Law in Australia* (1987) 470–472.
26 Planning and Environment Act 1987 (Vic.), s.3 ['development' and 'works']; Local Government Act 1962 (Tas.), s.733A ['development'].
27 Mining Act 1978 (WA), s.120.
28 Mining Act 1973 (NSW), s.116; Coal Mining Act 1973 (NSW), s.91.
29 Mineral Resources Act 1989 (Qld), s.8.1.
30 Environment Protection Act 1970 (Vic.); Environment Protection Act 1973 (Tas.); Environment Protection Act 1986 (WA).
31 E.g clean waters, clean air, noise control, waste disposal legislation.

jointed approach than in the case of the States.[32] Nevertheless the role of the Commonwealth is important for practical non-legal as well as legal reasons.

Take Victoria as an example of the comprehensive approach to environmental protection. Environment protection and pollution control, like land-use planning and mineral development management, fall within the legislative competence of the States. Sections 39, 41 and 45 of the Environment Protection Act 1970 (Vic.) proscribe pollution of water, air and land respectively. The test for pollution is the same in each case. The duty to avoid aggravated pollution, prescribed by s.59E of the Act, applies generally. Thus, the basis of liability, whether civil or criminal, is essentially the same in respect of each source of pollution. So too are the enforcement systems the same for each source of pollution.

In Queensland, on the other hand, air, water and noise are the subject of separate legislation. Although the State Environment Act 1988 (Qld) has introduced an element of coordination, at least institutionally, the basis of liability and the criteria for decision-making remain distinct. The same is true for New South Wales, though the centralised administration of the legislation by the single State Pollution Control Commission produces greater consistency in application.

Consider finally the scope of federal legislation. Although there is federal environmental impact assessment legislation,[33] the Commonwealth has not enacted legislation that protects the environment by controlling pollution arising from onshore mineral development operations. The Commonwealth, however, controls pollution in two particular contexts. Pollution of the sea by oil and by dumping are controlled by international conventions to which Australia is a party. In exercise of the external affairs power the Commonwealth has enacted legislation to protect the sea from the pollution covered by these international conventions.[34] The obligations created by this legislation apply to activities associated with offshore mineral development in relation to petroleum. In exercise of the overseas trade and commerce power, so far as it permits regulation of imports and exports, the Commonwealth has enacted the Hazardous Wastes (Regulation of Exports and Imports) Act 1990 (Cth), which seeks to ensure that exported or imported hazardous waste is disposed of safely so that human beings and the environment both inside and outside Australia are protected from the harmful effects of such waste.

Mechanisms for Enforcement

Whatever the basis of liability, it is enforceability which is particularly significant. Whether the legislation is comprehensive or fragmented, similar mechanisms are used to make it effective. The offending activity is prohibited without a licence. There is power to include in the licence

32 Fisher, op.cit., 26–36.

33 Environment Protection (Impact of Proposals) Act 1974 (Cth).

34 E.g Environment Protection (Sea Dumping) Act 1981 (Cth); Protection of the Sea (Civil Liability) Act 1981 (Cth); Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (Cth); Protection of the Sea (Powers of Intervention) Act 1981 (Cth).

conditions designed to meet the circumstances of each particular case. Provision is made for the revocation or cancellation of the licence in the event of non-compliance. This may be supported by powers of direct government intervention which take the form of directions or notices requiring the cessation of certain activities or the taking of certain measures to clean up the pollution that has occurred. If these directions are not observed, government may take the necessary action and the cost of doing so becomes a debt subject or not to a form of security and enforceable as such. In the last resort the directions are enforced by the criminal sanction.

Consider examples from two States: Queensland and Victoria. The clean air legislation in Queensland authorises a written notice to take whatever action is specified to prevent or minimise air pollution from scheduled premises.[35] This is enforceable only by a direction to comply with the requirements set out in the notice.[36] Failure to comply is an offence and no more.[37] The water pollution legislation, on the other hand, contains much more stringent powers of enforcement. For instance, the expenses incurred in exercising emergency powers to take action to prevent or abate water pollution are recoverable in the normal way as a debt.[38] In the case of water pollution caused by waste from a discontinued industry, trade or process, there are further enforcement provisions. Any expenses incurred in taking action to prevent or abate such pollution are, until paid, a charge upon the land in priority to all encumbrances except any in favour of the Crown and notwithstanding any change of ownership of the land.[39]

The Environment Protection Act 1970 of Victoria contains the widest range of enforcement mechanisms in Australia. There is a provision for pollution abatement notices in certain circumstances.[40] Under s.62A the Environment Protection Authority may by a pollution clean-up notice direct occupiers, polluters and dumpers to take specific measures to clean up the effects of pollution. The emergency powers in s.62B to similar effect are available in case of imminent danger to life, limb or environment. Pollution arising from commercial or industrial undertakings is deemed to have been caused by the occupiers unless there is evidence to the contrary.[41]

Finally, under s.62 the Authority may conduct or require a clean-up in a range of circumstances:

- when pollutants are being discharged;
- if a condition of pollution is likely to arise;
- if industrial waste or a potentially hazardous substance appears to have been abandoned or dumped;

35 Clean Air Act 1963 (Qld), s.28(2).
36 Ibid. s.28(3) and (4).
37 Ibid. s.46(1).
38 Clean Waters Act 1971 (Qld), s.35(4).
39 Ibid. s.34(2).
40 Environment Protection Act 1970 (Vic.), s.31A.
41 Ibid. s.62C.

- if industrial waste or a potentially hazardous substance is likely to cause an environmental hazard.

The definition of 'clean-up' includes the removal of the waste and the restoration of the environment to its previous condition.[42] Any reasonable costs are recoverable from the polluter in any court.[43] If not recovered because the occupier cannot be found and after a process of advertisement, these costs become a charge on the property as if the charge were a registered mortgage.[44]

This scheme is supported in two further ways. The first is the provision of financial assurances. These may be required for obligations in works approvals, licences or abatement notices in respect of Schedule 4 premises.[45] If costs are incurred by the Authority under s.62(1) or 62B(2), they are recoverable by making a claim on the assurance.[46] These assurances may be bank letters of credit, certificates of title, personal or bank guarantees, bonds, insurance policies or in some other form.[47]

A particular industry may be declared subject to an environment improvement plan and participants in the industry required to comply with its provisions.[48] An alternative is for the industrial entrepreneur to prove compliance with environmental standards by undertaking an environmental audit and securing an environmental audit certificate certifying compliance.[49] An audit is, in brief, a total assessment of any actual harm or possible risk affecting any beneficial use made of any segment of the environment.[50] This process may be an incentive for industrial self-regulation.

New South Wales has supplemented its pollution legislation by enacting a range of enforcement provisions of general application. Section 14 of the Environmental Offences and Penalties Act 1989 enables the court, in addition to the imposition of a penalty, to require the person convicted of the offence to take steps to prevent or abate any harm to the environment caused by the commission of the offence. Any costs incurred in protecting the environment are recoverable as a debt. An order may be made under s.16 directing the offender in case of failure to pay these costs not to dispose of property belonging to the offender. By s.18 such an order becomes a charge on the property subject only to any existing encumbrances or registered mortgages or other interests in land.

None of these environmental protection or pollution control provisions apply specifically to mining operations. Yet there would seem little doubt that they apply to activities forming-part of mining operations. Similarly, activities directed at mine-site rehabilitation fall within their scope. The principal source of rights and obligations in respect of

42 Ibid. s.4(1) ['clean-up'].
43 Ibid. s.62(2).
44 Ibid. s.62(3).
45 Ibid. ss.21(1)(ba) and 31A(2)(2A).
46 Ibid. s.67C.
47 Ibid. s.67B.
48 Ibid. s.31C.
49 Ibid. s.31C(4).
50 Ibid. s.4(1) ['environmental audit'].

mining operations, including rehabilitation, is the mining legislation itself and the instruments effective under this legislation. These may now be considered.

RESPONSIBILITY FOR MINE-SITE REHABILITATION

Introduction and Background

The rehabilitation of mined sites involves, in practice, a well-recognised program of planning and management.[51] The first step is the acquisition of information about the site to be mined and its surrounding environment. It is on the basis of this information that a program for the reclamation and rehabilitation of the site can be prepared. Ideally, this program will contain a series of sequential objectives to be achieved over the life of the project.[52]

The immediate objectives during the mining operations are likely to be these:

- to reduce the effect of wind and water erosion on exposed sites not currently subject to extractive use;
- to reduce nuisance by dust and noise as much as possible;
- to retain vegetation as much as possible;
- to comply with all legal conditions (statutory conditions and those in leases);
- to reclaim the mined areas on an ongoing basis in accordance with the longer-term objectives.

The longer term objectives are likely to include these:

- to identify the most desirable and effective use of the land after the cessation of mining;
- to prepare an ongoing program, consistent with management of the site during mining operations to achieve this ultimate objective as identified;
- to ensure that the ultimate use of the land complies with any legal requirements or obligations.

It now seems to be generally recognised that rehabilitation begins not upon the cessation of mining operations but at their commencement. Rehabilitation is an ongoing process throughout the life of the mining operations. A program requires to be in place at the beginning of the operations and to be implemented right throughout the mining process and in some important respects after mining has ceased. It needs to be sufficiently flexible to respond to changing circumstances, physical or commercial, in a way that ensures not only relative stability and certainty for the entrepreneur but also protection for the site and its environment.

Although the rehabilitation program directly affects the site and the

51 E.g Australian Mining Industry Council, *Mine Rehabilitation Handbook (1990).*

52 Much of the practical information contained in these paragraphs was provided by those departments responsible for administering the mining legislation in several jurisdictions, and by the Australian Mining Industry Council through its *Handbook.* This assistance is gratefully acknowledged.

site alone, the impact of the rehabilitated site upon its environment and the impact of the environment upon the rehabilitated site are clearly matters for consideration. This simply acknowledges that the owners or occupiers of the rehabilitated site must comply with general environmental legislation before, during and after mining and with any specific requirements applying to the site and its rehabilitation. It is, for example, possible that a rehabilitated site with little or no anticipated environmental consequence may cause environmental damage that subsequently produces an obligation enforceable under the general environmental legal system. Although this is a risk, it is a risk that should be reduced as far as possible in planning for rehabilitation.

Mining operations take place in different locations and for different minerals. There are different legal regimes that apply to different locations and minerals. Thus, offshore mineral regimes are in many respects different from onshore regimes. Petroleum is governed by its own legislation, while most other minerals usually fall within one other set of legislative provisions. Onshore mining operations for minerals other than petroleum receive the most detailed regulation of all minerals in any location. The distinctive treatment of petroleum is no doubt a reflection of its physical characteristics and the means used to produce it. Does this in itself justify a different approach to rehabilitation?

Onshore Petroleum Development

Consider first the legislation regulating petroleum development onshore. The legislation in Victoria, New South Wales and Queensland follows a similar pattern. It is concerned with the exploitation of the resource; preservation of the petroleum; and the provision of compensation, first for the owners and occupiers of land whose surface has been damaged, and second for the owners and occupiers of land injuriously affected by the mining operations.[53] The standard required of mining operators is good oil-field practice.[54] Work programs included in mineral development instruments[55] as conditions or incorporated by the legislation are directed towards the development of the resource without specific reference to environmental considerations.

What then is the legal position when production ceases? There is an obligation to inform the minister before abandonment of the well so that it is properly cased, plugged and shut off.[56] The purpose of these provisions is to ensure that petroleum does not escape and that water does not leak into a petroleum deposit. Moreover, on termination the site of the well is required to be cleared, the land handed over in good order and condition, and all plant and equipment on the site removed. The pro-

53 Petroleum Act 1958 (Vic.), ss.47 and 60; Petroleum Act 1955 (NSW), ss.48 and 53; Petroleum Act 1923 (Qld), ss.50 and 52.

54 Ibid. s.47(1); ss.64 and 66; and ss.33(1)(d) and 49.

55 The expression 'mineral development instrument' is used to describe any grant or authority under mining legislation irrespective of the particular nomenclature used in the legislation unless a particular reference is required.

56 Petroleum Act 1958 (Vic.), ss.48 and 49; Petroleum Act 1955 (NSW), ss.62 and 63; Petroleum Act 1923 (Qld), s.51.

vision of security to ensure performance of these obligations is either not required or at the discretion of the minister.[57]

South Australia regulates the provision of security on abandonment. A bond of $4000 or more, as the minister requires, is lodged before the grant of any licence and it is open to the minister to require further security in respect of this obligation.[58] It is seen not as a penalty but as liquidated damages in respect of any compensation payable. The duty to plug the well on abandonment is accompanied by a ministerial power to do so and to carry out what the holder of the licence should have done, at the expense of the holder of the licence.[59] It is not clear whether or to what extent this obligation may be covered by the bond required to be lodged before the grant of any licence.

It is only the legislation in the Northern Territory that provides for protection for the environment and for rehabilitation of mined sites. Special procedures apply to operations in any park or reserve subject to the Territory Parks and Wildlife Conservation Act. Any substantial disturbance of the surface of such land creates an obligation to comply with directions for protection of the environment.[60] An application for a production licence must incorporate proposals for the protection of the environment and for measures to be undertaken for the rehabilitation of the licence area or other affected areas.[61] A production licence is subject to any conditions specified by the minister.[62] Since proposals for environment protection and site rehabilitation are included in the application, there would seem no doubt that conditions related to these matters may be included in any subsequent grant of a licence. Moreover, the legislation itself specifies that an approved insurance policy is to be maintained for such period of the term of the licence as is specified to cover, among other things, damages arising out of damage to property or the environment, including pollution, seepage or contamination.[63]

The Northern Territory legislation prescribes general conditions for petroleum development instruments. There is a general obligation to carry out all activities in such a way as to cause as little disturbance as practicable to the environment, and to comply with any ministerial directions for minimising that disturbance or restoring or rehabilitating the disturbed surface area of the land.[64] There is a further obligation to comply with lawful ministerial directions in relation to the protection of the environment in or upon the permit or licence area or adjacent areas affected.[65] In the event of failure to comply with a ministerial direction, the minister may implement the directions; the costs and expenses so incurred are a debt due by the person to whom the direction was given.[66]

57 Petroleum Act 1923 (Qld), s.30; Petroleum Act 1967 (WA), ss.23 and 108.
58 Petroleum Act 1940 (SA), s.13.
59 Ibid. ss.65 and 66.
60 Petroleum Act 1984 (NT), s.15.
61 Ibid. s.45(1)(f).
62 Ibid. ss.47(1) and 54(1).
63 Ibid. s.54(2)(f)(ii).
64 Ibid. s.58(c).
65 Ibid. s.58(f).
66 Ibid. s.72.

There is, finally, a specific power given to the minister at the termination of the instrument to direct, *inter alia*, among others the restoration of the surface of the former permit or licence area where disturbed, and the taking of measures to rehabilitate the area to the satisfaction of the minister.[67]

Security for the performance of obligations is required in two different ways. Firstly, the holder of a production licence is required to maintain an approved insurance policy to cover the contingencies already mentioned. This policy covers two sets of circumstances.[68] One relates to well redrilling and well recompletion expenses, and the other to damages arising out of damage to property or the environment, including pollution, seepage or contamination. Secondly and more generally, the minister may by notice require an applicant for a permit or a licence to lodge a security in such form, for such amount and from such person as the minister thinks fit to secure the applicant's compliance with the provisions of the Act and the other conditions to which the permit or the licence will be subject.[69] No instrument will be completed until such security has been lodged.[70] This provision is cast in sufficiently wide terms to include compliance with conditions in the instrument or conditions in the legislation itself. The amount of security is at the minister's discretion. Since environmental protection and mine-site rehabilitation are clearly within the contemplation of the legislation, there can be no doubt that the holder of the instrument may be required to provide security in such amount as the minister determines to cover these obligations.

Although the construction and operation of pipelines are not strictly part of mining operations, they are often an important, if not vital, part of the whole process of petroleum production and distribution. What is the position when a pipeline licence expires or terminates? Take the Victorian legislation as an example. The licensee is required forthwith at the licensee's expense to remove such parts of the pipeline as the minister may direct and to restore the area concerned to a condition satisfactory to the minister.[71] The obligation applies to 'parts' of the pipeline not to the pipeline as a whole; otherwise the provision is clear. But the legislation is silent on its enforcement.

Offshore Petroleum Development

Operations for petroleum development offshore are governed by the constitutional arrangement between the Commonwealth and the States given effect in terms of the Petroleum (Submerged Lands) Acts enacted in 1980. The Commonwealth Act may serve as the reference. To the extent that offshore mining takes place on the bed of the continental shelf, Australia as a sovereign state must take into account its obligations under the Convention on the Continental Shelf of 1958. This provides in particular

67 Ibid. s.77(1)(c).
68 Ibid. s.54(2)(f).
69 Ibid. s.79(1).
70 Ibid. s.79(2).
71 Pipelines Act 1967 (Vic.), s.44.

that 'any installations which are abandoned or disused must be entirely removed'.

The Petroleum (Submerged Lands) Act 1967 of the Commonwealth has as its principal objective the exploitation of the petroleum resources of the continental shelf of Australia. Environmental considerations are themselves largely irrelevant within the framework of the legislation. Although exploration and development instruments may be granted subject to such conditions as the granting authority thinks fit,[72] the scope of the legislation is unlikely to justify the imposition of conditions for environmental protection unless there is specific authority to that effect. There is no such specific authority.

This is not to say that the legislation ignores the obligations set out in the Convention on the Continental Shelf. The legislation not only authorises regulations prescribing how the convention is implemented in Australia;[73] it also enables the relevant authority to give directions on any matter which may be the subject of such regulations.[74] This includes the adoption of codes of practice as the relevant regulatory instrument.[75] Thus, abandonment is largely governed by such directions and they usually require compliance with the code of practice promulgated by the Australian Petroleum Exploration Association.

Power is also conferred upon the relevant authority to give a number of directions during the currency or after the termination of the exploration, production or pipeline authority.[76] A direction may relate to:

- removing all property;
- plugging or closing off all wells;
- making provision to the satisfaction of the relevant authority for the conservation and protection of the natural resources in the area;
- making good to the satisfaction of the relevant authority any damage to the seabed or subsoil in the area.

In the event of failure to comply with any of these directions, the relevant authority may itself do what was directed by that authority.[77] Costs and expenses incurred in doing so are a debt due by the person to whom the direction was given.[78]

There appears, however, to be no further mechanism for enforcement of these obligations. The provisions relating to securities[79] seem to have no application and the conditions relating to insurance are linked to operations pursuant to the exploration, production or pipeline instrument.[80] There is nevertheless an inclusive reference to 'expenses of complying with directions with respect to the clean-up or other remedying of the effects of the escape of petroleum'. Thus, it would appear that fail-

72 Petroleum (Submerged Lands) Act 1967 (Cth), ss.33(1) and 56(1).
73 Ibid. s.157(3).
74 Ibid. s.101(1).
75 Ibid. s.157(2A).
76 Ibid. s.107(1) and (2).
77 Ibid. ss.102, 108 and 113.
78 Ibid. ss.102(2) and 113(3).
79 Ibid. s.114.
80 Ibid. s.97A.

ure to comply with a direction in relation to abandonment and the removal of property falls outside the insurance provision except perhaps in relation to the escape of petroleum.

Onshore Minerals Development

Mineral developments onshore for minerals other than petroleum are governed by the mining legislation applicable in each of the several jurisdictions in Australia. Whether or not environmental protection and mine-site rehabilitation are formally part of the legislative structure, there seems little doubt that each of the jurisdictions pays considerable attention in practice to these two issues. Moreover, in certain jurisdictions the law has recently undergone considerable change. The manner in which the law is applied is just as important as the law itself. The policies and guidelines that represent the practice are subject to constant review, and each jurisdiction is unique in several respects. It is thus essential to discuss each system in detail.

Tasmania

Tasmania presents a relatively straightforward structure. According to the Mining Act 1929, all mineral development instruments are granted subject to such conditions as may be prescribed[81] and, in the case of exploration licences, retention licences and leases, subject also to such conditions as the minister may think fit.[82] The Act is generally silent on the issues of environmental protection and rehabilitation. However, mining leases contain a statutory covenant to prevent erosion if the location of the site renders it liable to erosion by wind or water in the event of disturbance of the surface.[83] The covenant involves the deposit of a sum of money which may be forfeited if the covenant is breached. The minister may remedy the damage at the lessee's expense and the lessee is liable to pay any costs in excess of the deposit forfeited. Otherwise the deposit is returned by the minister.

So much for the provisions of the legislation. The practice in Tasmania is to incorporate, in the mineral development instrument, conditions relating to environment protection and mine-site rehabilitation. For example, a brief environmental impact statement is submitted with an application for a mining lease and this statement includes measures to be taken to protect the environment. This assists the minister in determining conditions to be included in any lease and the amount of any financial bond required to ensure rehabilitation. An application for an exploration licence involves a similar process. The lodgement of a bond, usually in the form of an irrecoverable bank guarantee, is necessary before a licence is issued.

It is the exploration licence or the mining lease which specifies the detail of these conditions. Consider the conditions incorporated in the schedule to the lease. One clause requires compliance with the terms and

81 Mining Act 1929 (Tas.), ss.15(1), 15A(2), 15B(3), 15BA and 25(2).
82 Ibid. ss.15B(3) 15BA and 46(2).
83 Ibid. s.46(1)(e).

conditions contained in the schedule and authorises the minister to carry out any work necessary to secure compliance and to remedy any damage arising from any breach. Then follows a requirement to provide a surety in a form approved by the minister for a sum appropriate for the purpose of meeting any costs to the minister through carrying out such work, and subsequently to pay the cost of any such work so far as it exceeds the amount of the surety. The surety is reviewable when there is a change of lessee, a change in the scale of operations or a change in the scale or nature of environmental impact.

Two clauses are specifically related to rehabilitation of mined sites. The first requires the lessee, upon conclusion of mining operations, to rehabilitate worked-out areas of the demised land, including revegetation of the land surface, to the satisfaction of the Director of Mines. The second requires the lessee to rehabilitate worked-out areas concurrently with mining operations so that the unrehabilitated area shall not exceed a specified number of hectares at any time except with the approval of the Director of Mines.

These quite specific obligations derive from the non-specific power to include conditions in the relevant instruments. The absence of specific powers in the legislation does not mean that the conditions are invalid. It does mean, however, that the minister is exercising a discretion that is very wide in scope. The presence of such a discretion leaves the mining entrepreneur with no alternative but to rely upon the stated policies and guidelines of the department. These can be changed at any time. Moreover, the conditions themselves provide for variation of the surety in certain circumstances.

It is significant that in addition to the requirements of the mining legislation, formal planning consent may be required from the local authority under the planning legislation. Mining operations involving more than 1000 tonnes per year are required to be licensed under the environment protection legislation. These activities attract a specific obligation for erosion control and progressive surface rehabilitation during the course of the work and for a period of two years thereafter if necessary.[84] Failure to comply, itself an offence, may be enforced by a notice specifying what needs to be done.[85] There is no further power of enforcement. These provisions supplement, but do not themselves authorise, similar conditions in the mining lease.

Western Australia

The legislation in Western Australia provides for the inclusion in mineral development instruments of such conditions as the minister thinks fit.[86] Specific provision is made for damage to the surface caused by mining on the foreshore, on the seabed, in navigable waters and on town-sites.[87] Disturbance of the surface by prospecting in a way that is

84 Environment Protection Act 1973 (Tas.), s.20(1).
85 Ibid. ss.20(3) and 20A.
86 Mining Act 1978 (WA), ss.40(1), 46, 57(1) and 71.
87 Ibid. s.26.

likely to endanger the safety of persons or animals must be made good.[88] Particularly important is the power of the minister on granting a mining lease or at any subsequent time to impose reasonable conditions for the purpose of preventing, reducing or making good injury to the natural surface of the land or anything on the natural surface of that land or any consequential damage to any other land.[89]

The legislation also provides for the payment of compensation in respect of mining operations in a range of circumstances.[90] These include:

- deprivation of use;
- damage to the natural surface of the land;
- severance;
- loss of or damage to improvements;
- social disruption.

The matters to be considered in determining compensation[91] are similarly wide ranging:

- geographical location and environment;
- use before and after mining;
- costs of restoring the surface;
- the practicability of restoring the surface.

The legislation requires the provision of security in such a sum and in a form approved by the minister.[92] This may be cash or some other method. Production of the security instrument is sufficient for judgment in a court. Enforcement, however, needs the minister's approval.

In the absence of any specific obligation in the legislation as to environment protection or rehabilitation, much depends in practice upon the way in which the power to include conditions in the instrument is exercised by the minister. All mining leases contain a condition requiring written approval from the State Mining Engineer to proceed with the project. This involves assessment of the project prior to productive mining. It can be anything from a small submission to a major environmental management proposal. This process constitutes a substantial delegation by the minister to the State Mining Engineer of power to approve the details of the proposed mining project.

In Western Australia, as in Tasmania, there is a close relationship between the mining and the environment protection legislation. Proposals likely to have a significant effect on the environment or proposals of a prescribed class are referred to the Environmental Protection Authority for further consideration and approval under the Environmental Protection Act 1986. Under this Act, approval is required from the Authority for the construction of works forming an integral part of the mining operations process.[93]

88 Ibid. s.46.
89 Ibid. s.84.
90 Ibid. s.123.
91 Ibid. s.124.
92 Ibid. s.126.
93 Environmental Protection Act 1986 (WA), s.53.

No doubt the pollution control division of the Environmental Protection Authority and the mining engineering division of the Department of Mines work in close collaboration on these applications for project approval and works approval. But these are distinctive processes and approval of one application is no guarantee of approval of the other. There is little doubt that conditions for environment protection and mine-site rehabilitation may validly be incorporated in approvals or grants under the Environmental Protection Act 1986 or the Mining Act 1978. What is at issue is the manner in which the approvals are given and the conditions incorporated in the approval.

It is a question of delegation and extent of delegation. Power to include conditions in a mining lease is vested in the minister, and power to include conditions in a works approval is vested in the Environmental Protection Authority. By making project approval by the State Mining Engineer a condition of the mining lease, the minister is conferring upon the engineer a power not available under the legislation. If the project is approved by the engineer subject to conditions, the conditions required by the engineer are included by the minister as further conditions in the mining lease under s.84 of the Mining Act 1978. This seems unexceptionable.

It is not a mere legal technicality. The project proposal addresses questions of environment protection and mine-site rehabilitation. Thus, the Department of Mines has formulated comprehensive guidelines for the environmental management of mining; rehabilitation plays a major part in this process. The guidelines contain a number of significant propositions, including these:

- All areas disturbed by the operations will be rehabilitated.
- This includes the removal of all plant, facilities and rubbish and the restoration of the land surface to allow vegetation to re-establish.
- There is a need to allocate financial resources to achieve effective environmental management.
- Expenditure for environmental management purposes should be integrated with all other components of the operating budget.
- The cost of rehabilitation should be expressed as part of the production costs and allocated as such.
- Determining final landforms prior to commencing operations is the only way the lowest overall operating cost will be achieved along with the rehabilitation objectives.

New South Wales

New South Wales, the first State to introduce environment protection and mine-site rehabilitation powers within the mining legislation, has subsequently complemented these powers through the introduction of mining rehabilitation and environmental management plans. The Mining Act 1973 creates a general duty to take into account the need to conserve and protect natural resources at large and certain elements of the environ-

ment in particular.[94] There is specific power to include conditions for environment protection in mineral development instruments[95] and more particularly power to include reinstatement conditions in a mining lease, including an existing lease.[96] If such conditions are included, the lodgement of appropriate security is required. Failure to implement these conditions gives the minister the power to direct implementation. If there is no compliance with this direction, there is further power in the minister to implement the conditions and recover the costs from the mining lessee; and these costs are recoverable as a civil debt.[97]

The general duty to take into account the need to conserve and protect natural resources and the environment is discharged in two ways. Conditions are included in all mineral development instruments that involve disturbance of the surface of land, and these require appropriate reinstatement, levelling, regrassing, reforesting and contouring. These conditions are approved by the Soil Conservation Service. It is, secondly, standard practice in New South Wales to include in any mining lease a requirement for a mining rehabilitation and environmental management plan. A similar condition is included in existing leases if this is legally possible. Such a plan is regarded as an ongoing flexible instrument for the management of the site. Its detail reflects the size of the development and the particular problems of the site. The plan is reviewed each year throughout the life of the project. The process is seen as an exercise in cooperation and collaboration between the department and the mining entrepreneur.

The cost of implementing the plan and the cost of rehabilitation measures are the responsibility of the mining entrepreneur. Although not included specifically in the legislation, it is consistent with the power of the minister to implement conditions and recover the cost of implementation from the holder of the mining lease. The mining entrepreneur is required to lodge a security deposit to ensure compliance with the conditions of the lease. The amount of this security is determined by the minister in accordance with the size of the development and the likely cost of rehabilitation. The amount is variable at specified intervals in accordance with the estimated costs of rehabilitation. If this security is insufficient to cover the costs, the minister may take appropriate measures and recover the costs directly from the mining entrepreneur.

The inclusion of conditions in a mining lease for reinstatement of the land is specifically authorised by the legislation.[98] There is no specific authorisation for a mining rehabilitation and environmental management plan. In practice the formulation of a plan is made a condition of the lease. The rehabilitation program is part of the plan and not a condition of the lease. Although this is an eminently sensible and practical way of handling the issue, it is an indirect intermediate mechanism and not recognised by the legislation.

94 Mining Act 1973 (NSW), s.117.
95 Ibid. s.118.
96 Ibid. ss.119 and 119A.
97 Ibid. s.120.
98 Ibid. ss.119 and 119A.

The regulation of mining operations in New South Wales is unique in one other respect. The common law recognises rights of support and liability for subsidence between adjacent landowners and occupiers. In New South Wales the common law has been modified by the Mine Subsidence Compensation Act 1961. The legislation creates the Mine Subsidence Compensation Fund, to which the proprietors of collieries make contributions.[99] Claims for payment out of the fund are for compensation for damage to improvements arising from subsidence in consequence of mining activities.[100] By 'improvement' is meant a building or a work on the land, and 'subsidence' for this purpose means subsidence due to the extraction of coal or shale or to prospecting in relation to coal or shale. The fund is liable to compensate for damage arising from subsidence provided the owner is not in arrears with statutory contributions and complies with the terms and conditions of the mineral development instrument to which the mining operations are subject.[101] The only exception is where the proprietor of the colliery is negligent in the conduct of the relevant mining operation.

South Australia

The legislation in South Australia relies less upon conditions incorporated in mineral development instruments and more upon the direct powers that it confers. The protection of flora and fauna and of the natural and built environments is part of the process for determining the conditions to be included in mineral development instruments in South Australia.[102] The rehabilitation of mined sites arises in several ways.

The legislation provides for the payment of compensation for any financial loss, hardship or inconvenience suffered by the owner of any land in consequence of mining operations conducted upon that land.[103] This includes damage caused to the land, loss of productivity or profits, and any other relevant matter.[104] In determining compensation, consideration is taken of any work undertaken by the mining operator to rehabilitate the land.[105] More particularly, where 'declared equipment' has been used in the course of mining operations, any land disturbed by these operations must be restored to a satisfactory condition.[106] 'Declared equipment' is presumably equipment that is likely to disturb the surface of land in the course of mining operations.

Two mechanisms are provided for enforcement. The first relates to the provision of a bond by way of security. A power is conferred upon the minister to require the holder of a mineral development instrument to enter into a bond for such sum and on such terms and conditions as the minister decides, to ensure that the mining entrepreneur will satisfy not

99 Mine Subsidence Compensation Act 1961 (NSW), s.10.
100 Ibid. s.12.
101 Ibid. s.14.
102 Mining Act 1971 (SA), ss.30 and 34.
103 Ibid. s.61(1).
104 Ibid. s.61(2).
105 Ibid. s.61(4).
106 Ibid. s.60(1).

only any civil or statutory liability likely to be incurred in the course of mining operations but also the present and future obligations of the mining entrepreneur for rehabilitation of land disturbed by these operations.[107]

It would appear that the source of these obligations does not matter. They may derive directly from the legislation, from terms and conditions specified in any relevant mineral development instrument, or perhaps from any other source, provided they arise in the course of carrying out the mining operations. It is significant that future as well as existing obligations are included. The provision of security for the performance of an obligation does not in itself create such an obligation. However, in the context of the statute as a whole and with particular reference to the other relevant provisions, it is reasonable to infer that the legislation has as one of its objectives rehabilitation of mined sites and that the power to include conditions in mineral development instruments will be interpreted accordingly.

Finally there is the Extractive Areas Rehabilitation Fund. Into this fund are paid all amounts received by way of royalty upon extractive minerals.[108] One of the purposes for which money in the fund may be spent is the rehabilitation of land disturbed by mining operations for the recovery of extractive minerals.[109] The scheme is limited to 'extractive areas' and 'extractive minerals'. Even so, it is a clear and simple method of allocating income from certain mineral developments to expenditure incurred in rehabilitating the site.

However, the fund alone is not responsible for the rehabilitation of mined sites. Regulations dealing, among other things, with quarrying operations create specific obligations related to rehabilitation. For example, the regulations deal with the amenity of the area affected by the operations; the protection of trees and shrubs; noise and dust; pollution of watercourses; the removal and storage of topsoil; the location of overburden; waste material and dams; the provision of drainage; the avoidance of erosion; and generally 'the proper rehabilitation' of the area. The approach in South Australia thus emphasises regulation and government control through intervention.

Northern Territory

It will be recalled that the legislation relating to petroleum development in the Northern Territory contains provisions for rehabilitation not included in the legislation of the other jurisdictions. The legislation governing mining at large similarly makes specific provision for environmental protection and mine-site rehabilitation. There are three particular features to the legislation. First, the legislation itself directly prescribes the conditions included in any exploration licence, exploration retention lease or mineral claim. Before carrying out any program involving substantial disturbance of the surface of the land, the mining entrepreneur is

107 Ibid. s.62(1).
108 Ibid. s.63(2).
109 Ibid. s.63(3)(a).

required to prepare a program for environment protection and to comply with any directions for protecting the environment in carrying out the program.[110] The same obligation relates to the disposal of waste. Lodgement of security may be required before a mineral claim is granted.[111]

The second feature relates to mineral leases, which are treated differently. An application for a lease is accompanied by particulars of proposals for progressive and final rehabilitation of the proposed lease area and by particulars of proposals for protecting the environment on and in the vicinity of the proposed lease area.[112] At any hearing an environmental study may be required.[113] A mineral lease contains conditions not only relating to the discharge of waste but also to rehabilitation. The leaseholder must first seek and consider advice from identified sources in relation to steps reasonably likely to encourage and promote regeneration and development of vegetation on mined areas, and must thereafter promote such regeneration and development in accordance with that advice as directed in writing.[114] Before granting a mineral lease, it is open to the minister to require the lodgement of security in such form as the minister determines to ensure compliance with the lease and its conditions.[115] Conditions so secured include not only those included by the minister in the exercise of ministerial discretion but also those prescribed for inclusion in the lease by the legislation.

The third feature of the legislation in the Northern Territory is the prescription of general conditions to which all mineral development instruments are subject. Mining operations must be carried out in such a way as to cause as little disturbance as practicable to the environment.[116] The mining entrepreneur must in addition comply with reasonable written departmental directions to take such action as considered appropriate to minimise or make good any damage caused by the mining operations.[117] Where a condition requires something to be done and there is a failure to comply, appropriate action can be taken and any costs incurred are a debt due by the mining entrepreneur.[118] It should be noticed that such an obligation may be secured by the lodgement of an appropriate security only in respect of a mineral lease or a mineral claim.[119]

Victoria

The mining legislation currently in force in Victoria does not directly create obligations in respect of environment protection or mine-site rehabilitation. Environment protection is regulated by the Environment Protection Act 1970 and rehabilitation of mined sites is an obligation

110 Mining Act 1980 (NT), ss.24, 45 and 89; [Act assented to in 1982].
111 Ibid. s.86A
112 Ibid. s.55.
113 Ibid. s.58(6) and (7).
114 Ibid. s.66(e).
115 Ibid. s.64.
116 Ibid. s.166(1)(a).
117 Ibid. s.166(1)(a).
118 Ibid. s.166(3).
119 Ibid. ss.64 and 86A.

which may be included as a condition in a mineral development instrument, or alternatively, become the subject of a departmental direction. It is open to the minister during the currency of a mineral development instrument to vary the conditions of the instrument upon request or on the mimister's initiative for the purpose of environment protection or for the progressive or eventual rehabilitation and stabilisation of the land.[120] The amount of any bond or security included as a condition may also be varied. The regulations make it a condition of every instrument that the mining entrepreneur shall take such action as may be required in relation to the protection, rehabilitation and stabilisation of land to the satisfaction of a mining inspector.[121]

There is a general requirement for an applicant for a mineral development instrument to lodge a bond or security to enable compliance with the conditions of the instrument.[122] The amount is set after consultation, although the regulations may prescribe a maximum amount. They may provide for the lodgement of a further bond or for the variation of an existing bond if the nature of the operations or the economic circumstances have changed. If any works directed to be carried out are not carried out, the minister may do so and recover any excess of costs over and above the bond from the mining entrepreneur.[123]

The production of extractive minerals is the subject of its own legislation in Victoria. In other jurisdictions extractive minerals are part of the general mining law or are provided for in their own terms as part of the general law. The Extractive Industries Act 1966 adopts the same approach as the general mining legislation. A lease or licence may include conditions for minimising adverse environmental effects.[124] A lease or licence may similarly be granted subject to conditions imposed by the minister as he or she thinks fit for reclaiming and stabilising land during the life of the quarry and after cessation of quarrying activities.[125] In determining any such conditions, the minister has regard to the safety of the public, the protection of watercourses and the environment, the amenity of the area, the use of surrounding land and any possible subsequent uses of the land.[126] A bond or security must be lodged to ensure compliance with any conditions in a lease or licence.[127] The minister, moreover, is specifically authorised to order the use of money in any such bond or security to achieve the reclamation and stabilisation of the land in question.[128]

The two most recent mineral codes to be enacted in Australia are the Mineral Resources Act 1989 (Qld) and the Mineral Resources Development Act 1990 (Vic.). Only the Queensland legislation is in force. Nevertheless, some reference should be made to the Victorian legislation since

120 Mines Act 1958 (Vic.), s.78A.
121 Mines (Mining Titles) Regulations 1983 (Vic.), reg. 1108.
122 Mines Act 1958 (Vic.), s.361A (1).
123 Ibid. s.361A(1), (2), (7) and (9).
124 Extractive Industries Act 1966 (Vic.), s.7B.
125 Ibid. s.7A(1).
126 Ibid. s.7A(4).
127 Ibid. s.7A(2).
128 Ibid. s.7A(5).

it, like the Queensland statute, provides for rehabilitation of mined land as a particular issue in itself.

The new Victorian legislation requires the holder of a mining licence to rehabilitate land in accordance with an approved rehabilitation plan[129] and the holder of an exploration licence to rehabilitate land in accordance with the conditions in the licence and the relevant code of practice.[130] In addition, the licensee must rehabilitate land in the course of doing work and must, as far as practicable, complete the rehabilitation of the land before the licence or any renewed licence ceases to apply to that land.[131]

There are two enforcement mechanisms in support of these obligations. One is the requirement for a rehabilitation bond.[132] The amount of the bond is determined after appropriate consultation[133] and the condition of the bond is that the licensee rehabilitate the land as required by the legislation to the satisfaction of the minister and the Director-General.[134] In addition, the minister is empowered to rehabilitate the land if the statutory requirement has not been satisfied, if further rehabilitation is necessary or if the owner so requests.[135] Any costs incurred by the minister in excess of the amount secured may be recovered as a debt due to the Crown.[136]

The two particularly innovative features of the Victorian legislation are the rehabilitation plan and the code of practice. The rehabilitation plan, prepared after appropriate consultation, takes into account any special characteristics of the land; the surrounding environment; the need to stabilise the land; and the desirability or otherwise of returning agricultural land to a state that is as close as is reasonably possible to its state before the mining licence was granted.[137] Rehabilitation thus reflects the wider environment and also the post-mining desirable uses of land.

A code of practice is adopted by the minister after the code has been tabled in each House of Parliament.[138] It is open to either House by resolution to approve the code with or without amendments, or to reject it.[139] The code may be adopted only as approved by both Houses or if neither House has rejected it.[140] Thus, a rehabilitation plan and a code of practice are instruments for managing the site of the mining operations in a way that responds to the particular circumstances of the location, its environment and the flexibility needed to produce an ongoing response to the duty to rehabilitate.

129 Mineral Resources Development Act 1990 (Vic.), s.78(1).
130 Ibid. s.78(2).
131 Ibid. s.81.
132 Ibid. s.80(1).
133 Ibid. s.80(2).
134 Ibid. s.80(3).
135 Ibid. s.83(1).
136 Ibid. s.83(4).
137 Ibid. s.79(a).
138 Ibid. s.125(2).
139 Ibid. s.125(2).
140 Ibid. s.125(4).

Queensland

The legislation currently prescribing rehabilitation in the greatest detail is the Mineral Resources Act 1989 of Queensland. The long title indicates that its purpose is 'to provide for the assessment, development and utilisation of mineral resources to the maximum extent practicable consistent with sound economic and land-use management'. Indeed, two of the objectives of the Act are to encourage environmental responsibility in prospecting, exploring and mining and to encourage responsible land-care management in prospecting, exploring and mining.[141] The references to environmental responsibility and responsible land-care management are particularly relevant to rehabilitation.

The duty to rehabilitate arises in four different ways within the legislation. Firstly, information must be provided in support of an application for a mineral development instrument. Information relating to the environment is required in respect of mining claims[142] and mining leases.[143] Secondly, each mineral development instrument contains a condition prescribed by the legislation relating to environmental impact control and rehabilitation of the surface of the land.[144] Thirdly, the holders of the three major instruments come under a specific statutory obligation to rehabilitate the land.[145] Fourthly, there is an obligation to provide security to be determined by the minister to ensure compliance with the conditions of any instrument and with the provisions of the legislation at large.[146] In the case of each mineral development instrument, the obligation to provide security is a prescribed condition of the instrument, and the manner in which the security is provided, including subsequent enforcement, is a direct provision of the legislation. In all cases the provision of further security, in addition to the original security, is contemplated, and in the case of a mining lease the amount of the security must be reviewed every five years.[147]

As far as rehabilitation is concerned, the provisions relating to the mining lease are the most important. An application for the grant of a mining lease includes a statement acceptable to the minister specifying, among other things, proposals for protecting the environment, including surface water and ground water, on and in the vicinity of the area of the proposed lease during its term, and also proposals for progressive and final rehabilitation of the land.[148] A mining lease is subject to three particularly relevant statutory conditions:[149]

(1) that the holder shall, to the satisfaction of the minister, provide for

141 Mineral Resources Act 1989 (Qld), s.1.3(d) and (g).
142 Ibid. s.4.14(1)(j)(iv).
143 Ibid. s.7.13(1)(o)(iv).
144 Ibid. ss.4.29(1)(e) and (f), 5.15(1)(b) and (c), 6.15(1)(b) and (c) and 7.33(1)(c) and (d).
145 Ibid. ss.3.25, 5.36 and 6.30.
146 Ibid. ss.3.10(7), 4.31(8), 5.16(7) 6.11(7) and 7.34(7).
147 Ibid. s.7.34(5).
148 Ibid. s.7.13(1)(o)(iv)(D) and (E).
149 Ibid. s.7.33(1)(c), (d) and (e).

the control of the impact on the environment of the operations carried out under the authority of the mining lease;

(2) that the holder shall undertake rehabilitation of the surface area comprised in the mining lease, and of any other land adversely affected by the carrying on of operations authorised by the mining lease, to the satisfaction of the minister;

(3) that the holder, prior to the termination of the mining lease for whatever cause, shall remove any building or structure purported to be erected under the authority of the mining lease, and all mining equipment and plant, on or in the land comprised in the mining lease, unless otherwise approved by the minister.

Except in the case of a mining lease, the legislation places an obligation on the holder of a mineral development instrument to rehabilitate progressively the surface of any disturbed land to the satisfaction of the minister.[150] In the important case of a mining lease, the obligation is built in as part of a wider obligation that has effect through a plan of operations. Not less than two months before the commencement of operations, a proposed plan of operations must be submitted to the minister.[151] The plan of operations indicates how the purposes for which the mining lease is granted will be carried out in accordance with the legislation and the conditions of the mining lease. The plan must satisfy the minister on four points,[152] namely, that the manner and method of carrying out the mining operation:

- are in conformity with the conditions of the mining lease and the provisions of the legislation;
- shall adequately provide for the control of the impact on the environment of the operations;
- shall adequately address the matter of rehabilitation of any disturbed ground within the boundaries of the mining lease;
- shall provide for the effective utilisation of the minerals mined in terms of the mining lease.

What is the status of a plan of operations? It is specifically provided that the plan of operations for the time being current forms part of the conditions of the mining lease.[153] This crucial provision gives to the plan the status of a condition. In practice, this means that failure to act in accordance with the plan is a breach of the condition of the lease. Thus, all the provisions in the legislation for ensuring compliance with conditions of the lease and with the provisions of the legislation are available in relation to a plan of operations.

If the plan of operations is an integral part of the legislation, it is also the foundation that supports the environmental policy for mining promulgated by government. The strategic objectives of this policy are clear: to ensure compliance with legal obligations imposed upon mining entrepreneurs by the mining legislation, with conditions in individual mining

150 Ibid. ss.3.25, 5.36 and 6.30.
151 Ibid. s.7.48(1).
152 Ibid. s.7.48(2)(a).
153 Ibid. s.7.48(2)(b).

leases, and with obligations imposed by environmental legislation. The details of this policy are the achievement of acceptable post-disturbance land use capability; stable post-disturbance land form; and the preservation of downstream quality. This is achieved by a system of environmental management that encourages industry self-regulation by incentives rather than regulation. If enforcement of legal obligation is necessary, it is very much a last resort.

This system of environmental management has legal effect through the obligation to submit a plan of operations which constitutes a condition of the mining lease. The plan of operations is linked to the details of the overall policy by either an environmental management overview strategy or a study of environmental impact. The strategy in effect shows how the plan of operations satisfies the legal obligations of the mining entrepreneur. This is done in three ways: the establishment of performance criteria, the availability of financial incentives, and a system of environmental auditing.

The performance criteria are linked specifically to the three detailed objectives of the policy. A category system is used to determine the capacity of the leaseholder to satisfy these performance criteria or, from another point of view, to assess the risk of non-performance by the leaseholder. Category 1 comprises the mining entrepreneurs who demonstrate actual or potential capacity to discharge their responsibilities, and category 6 those who are unable to do so. Those in category 6 have an approved plan of operations but not the demonstrated capacity to implement it. This means that the mining operations can go ahead, but subject to the most stringent supervision and control by the regulatory authorities.

The purpose of this complicated scheme is to encourage mining entrepreneurs to move voluntarily from category 6 to category 1. This is achieved through financial incentives operating in the context of the provision of security. The higher the risk of unsatisfactory performance against the environmental performance criteria contained in the policy, the higher the amount of financial security required of the mining entrepreneur. Or, from the other point of view, the greater the demonstrated capacity to satisfy the environmental performance criteria, the lower the amount of security required.

Although the legislation leaves the amount of security to be determined by the minister, the policy sets out how the amount of security required for a particular lease is determined. It includes a list of unit rates for rehabilitation which reflect the cost of third-party rehabilitation. A rate per hectare of land is related to a particular operation for the treatment of the surface of the land in question — for example, importing topsoil, preparing tailings dams for capping, or securing high walls or pit walls. The cost of rehabilitation is thus the sum of the required surface treatments for each hectare of land requiring treatment.

The sum assessed in this way is the amount of security required for the project. The amount actually payable depends on the performance category of the leaseholder. Mining entrepreneurs in category 1 pay 25 per cent, and those in category 6 pay 100 per cent.

The effectiveness of this complex incentive scheme depends very much upon an assessment of the capacity of the mining entrepreneur to satisfy the environmental performance criteria for the plan of operations in question. This is the role of the environmental auditor. The audit will confirm whether or not the mining entrepreneur can satisfy or has satisfied the environmental performance criteria. It is, moreover, expected that the audit will demonstrate compliance or otherwise with the approved plan of operations and the other legal obligations required of the leaseholder.

The Queensland system for environmentally sensitive management of mining operations is a sophisticated mixture of law and policy. It is a subtle blend of regulation and incentive. The objectives of the policy and the guidelines for achieving it are relatively detailed. It is thus possible for the mining entrepreneur to know reasonably clearly and in advance what is likely to be expected to ensure conformity with the legal obligation. To this extent, it is neither a discretionary nor an arbitrary system. Although the policy is plainly designed to place financial responsibility for good environmental management upon the entrepreneur, the advantage of this system for the entrepreneur is advance knowledge of the expectations of the regulatory authorities in both operational and financial terms. The result intended is greater economic efficiency, easier financial planning and a better environment.

FUTURE DIRECTIONS OF LIABILITY FOR MINE-SITE REHABILITATION

Protection of the environment and rehabilitation of mined sites are now matters of importance in the control of mining operations in Australia. The law fulfils these functions in order to:

- afford access to the mineral;
- afford access to the proposed mining site and to other land-related facilities;
- control mining operations by environmental protection and by the prevention of pollution;
- control mining operations by ensuring rehabilitation of the mined site at the end of the operations.

Despite the overall consistency of the objectives, the means of achieving them are remarkably different in each of the jurisdictions. This is particularly true in relation to the rehabilitation of mine-sites during mining operations and after their cessation. Liability for rehabilitation arises from obligations in respect of environment protection and pollution control, and from controls designed specifically for reclamation and rehabilitation. An obligation to rehabilitate takes one of several forms:

- a common law liability with largely retrospective effect;
- a duty created directly by environment protection or pollution control legislation;
- a duty created directly by mining legislation;

- a condition of an authority granted in exercise of executive power in environment protection or pollution control legislation;
- a condition of an authority granted in exercise of executive power in mining legislation;
- an expectation that is part of a management plan with the status of a condition of an authority granted in exercise of executive power under mining legislation;
- an expectation that is part of a management plan required as a condition of an authority granted under mining legislation.

Enforcement of these obligations is not easy for a number of reasons. The validity of the form or substance of the obligation may be in doubt. It may be difficult to define precisely the source of the obligation. The obligation itself may be relatively uncertain. The precise standard to be applied may be unclear. The person or institution attracting liability may be unclear. There may be difficulties in identifying ownership and occupation of land and so linking liability to land use. Causal relationships may be difficult to prove. The sums involved in rehabilitating land may be difficult to identify, and once they have been identified they may well exceed the resources of the person or institution primarily liable. Bonds may be inadequate because of increasing or unknown costs.

Despite these difficulties, the array of enforcement mechanisms is extensive. There are probably four kinds: (1) traditional legal sanctions, (2) government intervention, (3) financial incentives, (4) and non-financial incentives. Traditional legal sanctions include the use of the criminal law by creating specific offences with clear defences; the use of civil remedies by compensating for a loss that has occurred; and statutory compensation for damage of particular kinds. These remedies are readily available and regularly used. The criminal law is often a matter of last resort, although the increasing availability of the defence of due diligence is creating an incentive for careful environmental management. Notwithstanding their potential for deterrence, these remedies are by themselves unlikely to prevent environmental degradation or ensure rehabilitation.

It is common for government to exercise powers of intervention in the event of failure to comply with a legal obligation. This includes failure to perform directly prescribed statutory obligations, statutorily prescribed conditions of instruments, and such conditions administratively imposed. Intervention can take the form of cancellation or revocation of the instrument, pollution abatement notices, directions to use or not to use particular equipment, directions to engage in clean-up operations, or direct participation in clean-up operations where there is failure to comply with directions otherwise given. Where government directly incurs the expenses of clean-up operations, these expenses are a debt due to the Crown and enforceable by judicial process, or a debt due to the Crown secured on land or other property as a charge, mortgage or other form of security.

Frequently these obligations are themselves the subject of security specifically required by the legislation or as a condition of the instrument. The amount is usually determined in advance by the minister in exercise

of a discretion. Although the sum is predetermined, the growing practice is for the amount to be variable as circumstances change. The trend in the future may be for the amount of security to be determined more accurately in accordance with stated criteria and thus for the financial liability of the entrepreneur to be more accurately identified in advance.

There is a growing use of incentives, financial and non-financial, to encourage environmental responsibility. Specific obligations may be discharged by satisfying expectations set out in a site-management program perceived as sound in commercial and economic as well as environmental terms. Careful site management in accordance with such a program may also constitute a defence to an allegation, civil or criminal, of breach of statutory duty. Similarly, such a program may play a positive role in acquiring a certificate of compliance in the event of an environmental audit. More directly, financial incentives include additional charges for discharge of waste in excess of limits in a management program, reduced charges in case of lesser discharges, reduced amounts of security required in the event of demonstrated capacity for good environmental management, or reduced tax liability through allowance for environmental costs.

What direction is liability for mine-site rehabilitation likely to take? This depends on an answer to another question: Who is responsible for the quality of the site after cessation of mining operations? A political issue — but the answer is likely to be the mining entrepreneur *qua* polluter or site manager in the first instance, then the owner or occupier of the site, and finally the community at large in the last resort. It is, however, the potential for ongoing degradation long after mining operations have ceased which poses major problems for enforcement of legal obligation. It is suggested that the mining entrepreneur is likely to be legally responsible for:

- specific variable rehabilitation obligations during and after the mining operations;
- the particular means for discharging these obligations in accordance with a management program;
- identifying the particular costs associated with discharging these obligations in the manner proposed;
- providing financial security for the discharge of these obligations in accordance with certificated capacity to undertake sound environmental management during the currency of these obligations;
- creating, in addition, security over the land comprising the site and other land under its control, by way of mortgage or other form of charge or encumbrance over the land, in priority to or ranking with any other secured charge.

The community at large, acting through government or a similar agency, is likely to be responsible for:

- directly enforcing these operational and financial obligations through the judicial or the administrative processes, both civil and criminal;
- directly undertaking and discharging these operational obligations in the event of failure to do so by the mining entrepreneur;

- enforcing the subsidiary obligations of the mining entrepreneur which arise from an earlier failure to discharge these primary obligations;
- paying the costs associated with discharging the primary obligations of the mining entrepreneur out of funds provided by Parliament and supplemented by levies or charges on mining entrepreneurs who fail to manage sites in accordance with management programs;
- redistributing the costs associated with rehabilitation by allowing expenditure on rehabilitation of a particular site to be deducted from income past, current or future of the mining entrepreneur for the purposes of liability to tax.