POLICIES GOVERNING
EXPLORATION FOR AND PRODUCTION OF
COAL SEAM METHANE IN QUEENSLAND

Department of Minerals & Energy

November 1993
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**DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY**
1 EXECUTIVE SUMMARY

1.1 Background

Coal Seam Methane (CSM) is naturally occurring gas, principally methane, found in association with black coal seams. Long known as a hazard in coal mining, it has more recently been recognised as a potentially valuable resource in its own right.

In the United States a major CSM industry has been established, assisted by favourable taxation treatment as well as geological and economic factors. Over the past five years, considerable effort has gone into trying to replicate the US experience to establish a sustainable CSM industry here in Queensland.

The State has very large coal resources, particularly in the Bowen Basin of Central Queensland. These presently support a major export coal industry with an annual sales value of around $4 billion. They are also estimated to contain reserves of CSM potentially much larger than the conventional gas reserves of the North West Shelf.

More than $30 million has been spent over the past 5 years confronting a range of commercial and technical problems. Commercial viability is yet to be demonstrated, but results have been sufficiently encouraging to justify the attention of major exploration companies and increasing exploration budgets.

Studies have been carried out by two different groups: CSM explorers whose primary focus is petroleum exploration and development activities aimed at commercial recovery of the methane resource, and coal miners whose interest in CSM is as a by-product of their coal mining operations.

Because CSM occurs in coal seams which may themselves be amenable to mining, there is a potential for conflict between petroleum explorers and coal miners over rights of access to the gas. Current legislation and administrative arrangements do not address these issues and both sides of the industry have stressed the need for clarification so that exploration, testing and production investment can be carried on with certainty as to title.

The major part of this discussion paper is devoted to an analysis of the current legislative and administrative arrangements which apply to CSM investigation and recovery. Also, a series of Recommendations are put forward to help resolve the existing uncertainties and provide a sound framework for future CSM activities.

Both CSM explorers and coal miners involved in CSM production have advanced that the economic viability of CSM production requires supportive government policies. They have proposed a range of financial assistance measures to encourage the necessary investment in research, development and demonstration.

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The Queensland Government's normal practice is to deal with requests for financial assistance on a case by case basis, taking into account the financial requirements of the particular project and the return to the State expected as a result of any assistance provided. The issue of special financial consideration for CSM is being examined separately and is not addressed in this Discussion Paper.

1.2 Major findings and conclusions

Based on a review conducted by the Department of Minerals & Energy of the current legislation and administrative practice in relation to CSM, and of the options for creating a more clearly defined framework for operations, it is proposed that:

- The existing arrangement whereby coal and petroleum exploration titles may coexist should be retained;

- The existing arrangement whereby methane gas may be regarded as either coal or petroleum, and administered under either the Mineral Resources Act or the Petroleum Act depending on the circumstances, should be retained;

- Coal mining leases existing at the time of grant of an authority to prospect for petroleum (ATP) should be excluded from the ATP unless the mining lease holders agree to their inclusion. In these cases, an application by the lease holder for inclusion of "gaseous hydrocarbons" as an approved mineral on the lease should be supported.

- Petroleum authority to prospect holders should have the rights to all hydrocarbons within the ATP, irrespective of depth, and should retain those rights in the event of the subsequent grant of a mining lease for coal. In these cases, an application by the mining lease holder for inclusion of "gaseous hydrocarbons" as an approved mineral on the lease should not be supported while the petroleum title remains in force.

- All titleholders should be required to negotiate in good faith to enable the production of both coal and CSM wherever possible; in the event that such negotiations fail the Minister should have power to intervene to resolve the matter.

- Minor amendments will be required to both the Mineral Resources Act and the Petroleum Act to give affect to these arrangements.

These key proposals are detailed in the following Recommendations.
1.3 List of Recommendations

Legislative coverage

Recommendation 1: CSM activities continue to be conducted under either the Petroleum Act in the case of CSM exploration/production; or the Mineral Resources Act (or relevant franchise agreement Acts) in the case of coal mining.

Recommendation 2: All methane drainage-operations on coal leases

- be conducted in accordance with safety and risk management plans, approved and inspected under the Coal Mining Act and Regulations; and
- set operational standards equivalent to those required under the Petroleum Regulations (Land);

Recommendation 3: CSM exploration and production operations on titles granted under the Petroleum Act continue to be conducted in accordance with the requirements of the Petroleum Regulations (Land).

Operating Practice

Recommendation 4: Government and CSM explorers together develop Technical Guidelines for CSM Operations to provide guidance on sound operating practice.

Simultaneous exploration rights

Recommendation 5: In accordance with established principles of mineral law in Queensland, the practice of granting exploration permits for coal and authorities to prospect for petroleum over the same land continue, notwithstanding the potential which this creates for competing claims to CSM.

Recommendation 6: Conditions be included in all exploration and production titles for coal and petroleum to ensure that opportunities for coal and CSM explorers to realise benefit from their exploration investment are not unduly affected by grant of a production lease to another party (see Recommendations 18 and 19).

CSM in coal mining leases

Recommendation 7: It be recognised that coal mining lease holders have the right to produce and dispose of, but not automatically to use or sell, CSM from the coal mine precinct.

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Recommendation 8: Use or sale of gas produced by a coal miner from CSM drainage operations within a mining lease require authorisation by inclusion of "gaseous hydrocarbons" as an approved mineral under the lease.

Recommendation 9: Where existing coal mining leases already contain provisions authorising the extraction and disposal by sale of gaseous hydrocarbons, those provisions be reaffirmed.

Recommendation 10: Where a coal mining lease includes rights to produce gaseous hydrocarbons, those rights be interpreted as extending to all of the hydrocarbons occurring in or in association with coal seams within the lease.

Recommendation 11: Departmental Policy be that applications by coal mining lease holders under section 7.53 of the Mineral Resources Act for inclusion of "gaseous hydrocarbons" on their leases be supported if rights to CSM have not already been granted to another party by virtue of an exploration or production title issued under the Petroleum Act, but be refused if such prior rights exist.

CSM within authorities to prospect for petroleum

Recommendation 12: Where a mining lease is applied for over an area already covered by an ATP, grant of the application will not result in the area of the lease being excluded from the ATP.

Recommendation 13: The restrictions on access to CSM currently contained in existing ATPs be altered by deleting the current exclusion clause and replacing it with an exclusion contained in the Schedule of Land to the following effect:

"Exclusive of the land contained within Mining Leases No.xxx, yyy, zzz, being mining leases for coal current at the date of grant of this Authority for as long as those leases or any titles arising from them continue to subsist.

Recommendation 14: The conditions of any Exploration Permit for Coal covering a pre-existing Petroleum Lease be amended by excluding the Petroleum Lease from the Schedule to Land comprising the Exploration Permit.

Recommendation 15: The exclusion of pre-existing coal leases from an ATP, or Petroleum Leases from an Exploration Permit for Coal, may be waived with the agreement of the lessee.

Recommendation 16: Authorities to Prospect provide the holder with rights to all gas, whether conventional or CSM, in the ATP area irrespective of depth.

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
Recommendation 17: In considering requests for approval of specific CSM exploration, testing and production programs, the Government take account of the likely impact on future mineability of the coal.

Negotiation requirements

Recommendation 18: Every petroleum authority to prospect and every petroleum lease contain conditions requiring the holder to negotiate in good faith with the holder of any coexisting coal mining lease to enable gas levels in the mine precinct to be reduced to safe and efficient operating levels.

Recommendation 19: Every exploration permit for coal and every mining lease for coal contain conditions requiring the holder to negotiate in good faith with the holder of any coexisting petroleum title to allow CSM activities to continue on a basis which does not unreasonably interfere with the coal mining operations.

Recommendation 20: In the event that negotiations referred to in Recommendations 18 or 19 above break down, the Minister be given power to authorise CSM exploration or production activities on the mining lease, and to determine the terms and conditions under which such activities may occur.

Necessary legislative amendments

Recommendation 21: The definition of "mineral" in the Mineral Resources Act (section 1.8) be altered to include:

"hydrocarbons occurring in association with shale or coal the subject of a mining lease except where such lease lies upon an exploration or production title previously granted under the Petroleum Act."

Recommendation 22: The definition of "petroleum" in the Petroleum Act be modified to exclude gaseous hydrocarbons as redefined in the Mineral Resources Act.

Recommendation 23: The Mineral Resources Act be amended to allow that, if the Minister is satisfied that:

* the holder of an exploration or production title under the Petroleum Act which is coincident with a mining lease for coal has been unable to negotiate with the lease holder reasonable terms and conditions for conducting petroleum exploration or production activities normally authorised under such title; and

* such activities can reasonably be conducted without undue detriment to the mining activities on the lease
then the Minister may grant the petroleum title holder permission to conduct such activities, and may determine the terms and conditions under which they shall be conducted.

Recommendation 24: The Petroleum Act be amended to allow that, if the Minister is satisfied that:

- the holder of an exploration or production title under the Mineral Resources Act which is coincident with a petroleum lease has been unable to negotiate with the lease holder reasonable terms and conditions for conducting coal or mineral exploration or production activities normally authorised under such title; and

- such activities can reasonably be conducted without undue detriment to the petroleum production activities on the lease

then the Minister may grant the coal or mineral title holder permission to conduct such activities, and may determine the terms and conditions under which they shall be conducted.
2 EXPLORATION HISTORY

2.1 Coal Seam Methane in Queensland

Coal seam methane drainage activities began in Queensland in 1976 when the first Authorities to Prospect (ATP 226P, 231P and 233P) were issued. Since then some 25 ATPs have been issued making specific provision for CSM activities.

Over $30,000,000 has been spent undertaking research, exploration and production testing to assess the commercial viability of methane drainage.

There are 22 current ATPs and one is under application. The major operators at the present time are Mount Isa Mines Ltd (ATPs 447P and 524P), MGC Resources Australia Pty Ltd (ATP 364P), Seamgas Enterprises Pty Ltd (ATP 486P), TMOC Exploration Pty Ltd (ATPs 403P and 516P) and ENRON Exploration Australia Pty Ltd (ATP 529P).

Five of the ATPs (364P, 403P, 447P, 516P and 524P) cover most of the outcropping Bowen Basin, the principal coal basin in Queensland. ATP 529P covers about a quarter of the Galilee Basin.

As well as the operations carried out under Authorities to Prospect for petroleum, a number of methane drainage operations have been carried out in coal mining leases, principally to enhance safety and operating conditions in the mines. One such operation is currently in progress at BHP Australia Coal’s Moura mine.

In the year to June 1993, coal seam methane drainage activities in Queensland reached record levels. 19 wells/stratigraphic bores were drilled, and gas produced during testing increased nearly 100%. The number of Authorities to Prospect increased and field activities grew steadily with exploration expenditure increasing nearly 50% over the past twelve months.

The current high interest in coal seam methane, some encouraging production results, the deployment of new stimulation techniques and the maturing of exploration programs in a number of ATPs point to further exciting developments in CSM in Queensland.

2.1.1 Bowen Basin

In May 1976 Houston Oil & Minerals of Australia Inc was issued with ATPs 226P, 231P and 233P in the Bowen Basin of Central Queensland. The company was interested in both conventional hydrocarbons and coal seam methane. Two wells were drilled (HOM Carra 1 and HOM Kinma 1) and two older wells drilled in 1969 (TEP Moura 1) and 1975 (HOM Shotover 1) were re-entered and completed as methane drainage wells. Of the four wells only one (HOM Moura 1) was hydraulically fractured. Gas production peaked at a rate of 106 000 standard cubic feet per day (3000 m3 per day) during a three month...
production period. The test was interrupted by mechanical problems and eventually the company abandoned the wells.

In March 1980 BHP Petroleum Pty Ltd (formerly known as Hematite Petroleum Pty Ltd) was granted ATP 273P to explore for and produce methane from coal seams being worked by the company's coal mining division at the Leichhardt Colliery. The main aim was to degasify the working seam and so to improve the safety and operating conditions of the mine. Four wells (HPP Gemini 1-4) were drilled ahead of the working face in an attempt to lower gas levels in the seam. All wells were fracture stimulated using nitrogen foam fluid. Production testing lasted between 9 and 17 months with the average daily gas production rate of 42 000 standard cubic feet (1190m³). Gas production rates were considered uneconomic and the wells were abandoned.

It was not until July 1985 that an ATP (ATP 352P) was issued solely for methane drainage for commercial production. This ATP was voluntarily surrendered and reissued as ATP 364P in March 1986. ATP 364P covers the northern half of the exposed section of the Bowen Basin, Queensland's major coal basin. The ATP is currently operated by MGC Resources Australia Pty Ltd for MGC Resources Australia Pty Ltd (75%) and Mount Isa Mines Ltd (25%).

Within ATP 364P 24 wells have been drilled amounting to over 15700m (average depth 654.7m) with another 5 planned. Of the 24 wells drilled, 14 have been being production tested, but only 5 are now being tested. Test periods have ranged from three months to 51 months. The rest of the wells were drilled for stratigraphic and/or coal quality information. Since 1988 there have been three seismic surveys in ATP 364P, totalling 382.2km.

At the Broadmeadow site within ATP 364P, production testing commenced in November 1987 and is continuing at the present. Daily production rates per well vary greatly from approximately 1 000 scf (30 m³) to approximately 170 000 scf (50 000 m³). Sixteen wells (production and stratigraphic) have been drilled at Broadmeadow. Currently 4 wells are on test but previously up to twelve wells at any time were under test.

Elsewhere within ATP 364P MGC Resources Australia Pty Ltd conducted a drilling program to the northeast of Broadmeadow. Three wells were drilled; two of these (MGC Kemmis Creek 1 and MGC Ellensfield 1) were put on test but have now been abandoned.

In January 1988 ATP 391P was issued covering the southeastern part of the Bowen Basin. This ATP is still current (as ATP 524P). An active program of exploration, drilling and testing has been carried out by the holders, Mount Isa Mines Ltd. Fifteen wells have been drilled amounting to over 7100m (average depth 714.9m). Two have been production tested and one is currently still being tested. The others were drilled for stratigraphic and/or coal quality information. Three seismic surveys totalling 76km have been run in the ATP.

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At the Dawson River site, near Theodore within ATP 524P, production testing commenced in June 1990; one well (NQE Dawson River 3) remains on test. Two wells, NQE Dawson River 2 and 3, were initially tested. Daily production rates initially ranged up to 28 000 scf (800 m³) but declined over time. NQE Dawson River 2 was suspended in May 1991, but in late November and early December 1992 was used for a trial of the "cavity completion" stimulation technique. Results have not yet been released.

In January 1990 ATP 447P covering the central Bowen Basin was issued to Mount Isa Mines Ltd. A six well stratigraphic drilling program was commenced in 1992. Three seismic surveys totalling 165km have been run in ATP 447P.

2.1.2 Bowen Basin: work in coal mining leases

As well as the exploration and testing carried out in ATPs for petroleum, there has been some work undertaken for coal seam methane drainage in coal mining leases in the Bowen Basin.

In March 1989 Capricorn Coal Management Pty Ltd, operators of the Central Colliery at German Creek, drilled a surface vertical bore to investigate fracture stimulation in the German Creek Formation. The area of the fracture was subsequently mined through, providing valuable information on fracture geometry.

Since early 1991 BHP Australia Coal Ltd has been carrying out a program of coal seam methane production testing from surface wells drilled within the Moura mining lease (ML 5644). Five wells have been drilled down dip of the working face of the Moura No.2 Colliery, amounting to 1790.6m (average depth 358.1m).

In addition to the surface-based coal seam methane tests, both Capricorn Coal Management and BHP Australia Coal have conducted horizontal drilling programs from within the mine workings for in-seam drainage of gas.

2.1.3 Other basins

With increasing interest in coal seam methane, other sedimentary basins in Queensland are now being investigated for coal seam methane potential. These include the Galilee, Mount Mulligan and Calen Basins of Permian age; the Ipswich Basin of Triassic age; and the Moreton Basin of Jurassic age.

At present, drilling for coal seam methane has only been undertaken in the Ipswich Basin and the Galilee Basin.

In January 1988 Beach Petroleum NL was issued ATP 390P over the Ipswich Basin and parts of the Moreton Basin. Beach Petroleum conducted a number of office based studies into the feasibility of the area for methane drainage before relinquishing the ATP in January 1990.

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
In January 1991 ATP 486P was issued to Seamgas Enterprises Pty Ltd over part of the southern Ipswich Basin. Two stratigraphic wells to investigate the seams of the Ipswich Coal Measures were drilled. Results were not encouraging, the seams being less extensive and of poorer quality than anticipated.

Work in the other ATPs issued since June 1989 has been restricted to office-based evaluation studies which may form the basis of subsequent field programs.

2.2 Coal Seam Methane in the United States

Much of the work on CSM conduct in Queensland to date has been based on technology and research developed and in use in the USA.

A major CSM industry has emerged in the US over the past twenty years or so, with the major commercial development occurring since the early 1980s. This activity is centred in two main areas: the San Juan Basin of Colorado and New Mexico and the Black Warrior Basin of Alabama.

Research in the US took over ten years to develop successful techniques which today deliver annually $570 \times 10^9$ scf ($16 \times 10^9$ m$^3$) of gas to markets from approximately 5300 wells. This is equivalent to about 3-4% of US natural gas production.

Significant research into CSM began in the US in 1971, but it was not until 1981 that the first commercial sale of coal seam methane occurred. Through the remainder of the 1980s, $1.5 \times 10^{11}$ scf ($4.25 \times 10^9$ m$^3$) were produced, with a nearly four-fold increase in yearly production over the last five years.

The dramatic growth of the US CSM industry occurred in the context of government policies, marketing and infrastructure arrangements, petroleum industry economics and fundamental geological conditions which are all significantly different from those prevailing in Queensland.

Specifically, the growth of the US CSM industry benefited from:

- a substantial income tax credit offered by the US Government to encourage exploration for "alternative" energy resources in the wake of the second oil price shock. While this tax credit was a major factor in the growth of CSM in the United States, conventional petroleum operators have argued that it resulted in a major withdrawal of funds from conventional exploration;

- a relatively high population density and ready availability of markets in proximity to the producing basins, together with an extensive network of relatively low-pressure gas pipelines through which CSM production could be readily distributed;
ready availability of drilling equipment and petroleum engineering services based on the conventional petroleum exploration industry resulting in a much lower exploration cost structure in the US compared with Australia;

geological basins with extensive data available from conventional petroleum exploration drilling and favourable conditions in terms of porosity, permeability and geomechanics.

It cannot, therefore, be assumed that the US experience can be readily replicated in Queensland. However the success of the US industry demonstrates that, under the right conditions, CSM can be a commercially viable resource of considerable economic significance.

3 INDUSTRY SUBMISSIONS

For the purposes of this discussion, the terms "CSM explorers" and "coal miners" will be used to distinguish between those involved in CSM primarily from a petroleum exploration perspective (generally operating under an Authority to Prospect for petroleum in accordance with the Petroleum Act) and those whose interest in CSM is as an incidental activity connected with safety and efficiency of coal mining operations (generally conducted under a mining lease in accordance with the Mineral Resources Act).

Both CSM explorers and coal miners have expressed concern with the lack of certainty regarding rights to CSM and the resultant potential for dispute.

In other regards, the views of CSM explorers and coal miners differ strongly, as shown in the following summary of the various submissions received on the topic of legislative and administrative arrangements.

3.1 Issues raised by CSM explorers

The following are some of the issues which have been raised by CSM explorers:

- current exclusion from coal leases and from coal shallower than 300m;
- possibility of future coal leases extinguishing opportunities for development by the ATP holder;
- pre-emptive rights available to certain coal producers (eg. the Thiess Dampier Mitsui Agreement Act);
- granting of rights to gaseous hydrocarbons under mining leases;
- priorities as between coal mining lease holders and CSM petroleum lease holders;

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interference with established CSM production operations by new coal lease approvals;

onerous operational regulations under the Petroleum Act.

CSM explorers have proposed that:

- legislation should be amended to provide that all CSM is petroleum under the Petroleum Act;
- "gaseous hydrocarbon" rights granted to coal lease holders should be revoked. Accordingly, coal lease holders should have no right to dispose of CSM for commercial advantage;
- No further "gaseous hydrocarbon" rights should be granted for coal mining leases;
- Coal industry and petroleum industry should be granted co-existing rights to enable maximisation of extraction of both coal and coal seam methane;
- Any right of the coal miner to access CSM should be limited to that reasonably necessary to allow the safe conduct of current mining operations or of future operations contemplated within a relatively short time period (say 2 years); the coal miner should not be able to obtain automatic access to all of the CSM within a mining lease;
- Negotiation and agreement between all parties should maximise use of both coal and CSM, allowing orderly development and timing of all aspects of exploitation;
- Government should adopt "multiple resource development" policies rather than "first in time, first in right" policies.

3.2 Issues raised by coal miners

The following are some of the issues raised by coal miners in relation to CSM exploration and production:

- concerns over loss of autonomy to deal with gas in their existing leases and operations;
- concerns over loss or limitation of rights already granted to "gaseous hydrocarbons" under leases;
- potential for CSM operations to interfere with coal mining operations;

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potential for CSM stimulation activities (eg. fraccing, cavity completion) to adversely affect future mineability, particularly in areas of high horizontal stress and in thick seams likely to be mined at less than full seam height;

importance of effective degasification of coal to viability of mining in deeper, gassier seams;

importance of offsetting costs of degasification through utilisation/sale of CSM from coal leases where possible;

concerns that CSM producers, if given access to CSM within coal mining leases, may reduce gas levels only to the point of economic break-even rather than to the levels necessary for safe mine operation, leaving the coal miner with the cost of further degasification and no opportunity for offsetting revenue;

legislative responsibility for safety and health aspects of CSM operations.

Coal miners have proposed that:

• CSM should continue to be regarded as either a mineral under the Mineral Resources Act or petroleum under the Petroleum Act depending on the circumstances.

• title to CSM should be available under both Acts as at present;

• title to CSM should be automatically granted to the holder of a coal lease;

• where potentially mineable coal resources exist the relevant mineral title should automatically permit extraction of CSM because the coal is the more valuable resource and coal and gas extraction need close co-ordination to ensure safe mining conditions;

• coal miners should have the right to sell CSM produced as a result of pre-drainage activities within mining leases;

• in areas where mineable coal and gas resources co-exist in the same stratum, overlapping titles should not be issued;

• the current exclusion of CSM explorers from coal shallower than 300m should be maintained, or even extended to greater depths (perhaps to 600m) more likely to reflect the longer term economic limits of underground coal mining operations;

• understanding of the effects of coal seam fraccing prior to mining is important because of the potential to adversely affect future mineability;

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4 OBJECTIVES AND PRINCIPLES

While it is clear that both CSM explorers and coal miners agree on the need for clarification of the legislative and administrative arrangements governing access to CSM resources, it is equally clear from the preceding section that there are many issues on which CSM explorers and coal miners hold views which are different and in some cases diametrically opposed. In these circumstances, the Government will not be able to put in place processes which satisfy all of the views expressed. Rather, the Government must seek to establish administrative and legislative arrangements which meet the objectives of:

- providing a consistent, logical and equitable approach to the regulation of coal seam methane operations;
- providing clear rules and guidelines which will allow investment decisions to be made with confidence and which ensure security of title to coal seam methane resources;
- ensuring that priorities to exploration and production titles are unambiguous;
- providing a framework within which maximum utilisation of available resources (both coal and gas) is encouraged.

In terms of equity, sovereign risk and investor confidence, it is essential that companies know that their investments in exploration and development will not be negated or significantly impaired as a result of the grant of a lease or licence to another party. This is fundamental to the maintenance of a favourable investment climate. Accordingly it is proposed that the following principle be adopted in the analysis which follows:

Principle 1 - Prior rights to resources established by title and activity should be protected. Investment in exploration and development (whether for CSM or for coal mining) should not be jeopardised by the subsequent grant of titles without reasonable commercial compensation.

The objectives set out above also reflect the fact that both resources are, or have the potential to be, very valuable State assets. It is important that Government policies seek to maximise the value of those assets.

However the priorities and decision criteria for CSM explorers and coal miners do not
always coincide. It may therefore be necessary to constrain activities focussed on development of one resource in order to protect opportunities for development of the other.

When faced with such trade-offs, the Government must consciously and conscientiously determine whether the coal resource or the CSM resource should take precedence. A rational basis for this decision involves considering the relative worth of the two resources, in terms of intrinsic value and potential royalty returns.

In Table 4.1, the relative value of coal and CSM is compared by considering the amount and value of gas contained within a unit volume of coal according to the stated assumptions.

In the example illustrated, the intrinsic value of the coal is approximately 40 times greater than that of the CSM, and the notional royalty value of the coal (that is, the direct return to the state which would arise from commercial production under current royalty arrangements) approximately 30 times greater from the coal. While the assumptions used could be varied to reflect different circumstances, the overall result would not change significantly: coal is clearly the resource of superior value.

In developing a legislative and administrative framework for CSM exploration and production it is proposed that the following Principles be adopted:

Principle 2 - Both coal and coal seam methane are valuable resources and Government policy will wherever possible encourage recovery and utilisation of both resources.

Principle 3 - Because coal has the greater intrinsic value Government policy will where necessary give priority to protection of the coal resource.
### Table 4.1 - Comparison of the relative value of Coal and CSM

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5 LEGISLATIVE AND ADMINISTRATIVE ISSUES

5.1 Legislative coverage

5.1.1 Title to Coal Seam Methane

Under current arrangements, coal seam methane may be regarded as either a "mineral" under the Mineral Resources Act or as "petroleum" under the Petroleum Act depending upon the circumstances in which the gas is produced.

The Mining Act 1968-1986, which was the predecessor of the Mineral Resources Act, defined "mineral" to include:

"hydrocarbons occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connexion with mining for shale or coal or the extraction or production of mineral oil therefrom."

A corresponding definition in the Petroleum Act 1923-1991 defines petroleum as

"all naturally occurring hydrocarbons and naturally occurring mixtures of hydrocarbons but not including hydrocarbons occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connexion with mining for shale or coal or the extraction or production of mineral oil therefrom."

It is clear under this definition that any methane other than methane released in actual mining operations would be classed as petroleum and would come under the Petroleum Act.

The definition of "mineral" in the Mineral Resources Act 1989-1990 excludes petroleum within the meaning of the Petroleum Act, and includes:

"hydrocarbons occurring in association with shale or coal and necessarily mined, extracted, produced or released by or in connexion with mining for shale or coal or for the purpose of enhancing the safety of current or future mining operations for coal or the extraction or production of mineral oil therefrom."

The inclusion of the reference to "safety of current or future mining operations" has introduced an inconsistency with the Petroleum Act which creates a degree of uncertainty as to which legislation covers pre-drainage of methane from a seam not yet being mined, but intended for future mining.

The rights to conduct methane drainage exploration and evaluation operations other than in association with coal mining are presently provided for by way of Authorities to Prospect (ATPs) granted under the Petroleum Act. Although no commercial production of

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coal seam methane is yet occurring in Queensland, such production would be authorised under a Petroleum Lease. Petroleum Leases are available as of right to any ATP holder able to support a declaration that commercially viable coal seam methane exists within the ATP.

The coal seam methane operations presently being undertaken on coal mining leases are of two basic types:

• in-seam drainage activities involving the drilling of horizontal boreholes from within the mine workings. In these situations, the methane is gathered from each horizontal borehole underground through a system of pipework which is then linked to a vertical borehole, to allow the gas to be conveyed to the surface for disposal.

• surface drainage operations involving drilling of vertical holes, with the purpose of either intersecting and removing the gas from coal seams in an area designated for future mining (pre-drainage), or intersecting previously mined areas in which are accumulated volumes of gas detrimental to ongoing operations (goaf drainage).

Drainage of methane from within the actual workings of an underground coal mine is presently conducted by authority of a mining lease granted under the Mineral Resources Act or, in the case of mines operating under special franchise agreements such as the Thiess Peabody Mitsui Coal Pty Ltd Agreement Act, mining leases granted pursuant to those agreements. The same is true of pre-drainage and goaf drainage activities involving vertical drilling from the surface of coal mining leases.

The question which needs to be answered is whether the existing framework should be maintained, or other arrangements introduced.

The available options include:

• Regarding all CSM as "mineral" under the Mineral Resources Act;

• Regarding all CSM as "petroleum" under the Petroleum Act;

• Distinguishing between CSM produced by in-seam drainage from within coal mine workings ("mineral") and CSM produced by drainage operations conducted from the surface, whether as primary CSM exploration and production or as an adjunct to coal mining ("petroleum");

• Maintaining the same basic arrangements as at present, with modifications to legislation and formal administrative policy to resolve areas of ambiguity.

There is no clear argument which would favour regarding all CSM as either "mineral" or "petroleum". US experience in this regard has limited value to Queensland circumstances because of the fact that in the US ownership of minerals and petroleum generally runs

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with the land, whereas in Queensland all minerals and petroleum are owned by the Crown. Moreover, the US case law on this question is inconclusive\(^1\).

CSM explorers have specifically sought a declaration that all CSM is petroleum; coal miners on the other hand have proposed that CSM continue to be regarded as either "mineral" or "petroleum" depending on the circumstances.

It is not clear that defining all CSM as petroleum or, for that matter, as coal would support the policy objective of encouraging maximum utilisation of both resources.

Drawing a distinction between surface-based CSM operations as "petroleum" activities and in-seam drainage operations conducted from within mine workings as "coal mining" activities could address many of the concerns raised by both CSM explorers and coal miners.

This would allow all surface drainage operations to be brought under the *Petroleum Act* thereby resolving questions of priority and access to land for exploration purposes; avoiding to a large degree the problem of alienation of the rights of petroleum explorers when a coal lease is granted over part of their ATP; and addressing the problem of "different rules for different sites".

In order to preserve the rights of coal miners to pre-drain gas within their leases (such rights having, in some instances already been granted in lease conditions) it would be necessary to allow coal miners to take up petroleum exploration and production rights over their leases.

However requiring coal lease holders to take out petroleum titles in order to undertake surface methane drainage work would involve a significant additional administrative burden for industry and government.

It is considered that a similar outcome could be achieved by maintaining the same basic arrangements as at present (that is, coal mine predrainage and goaf drainage authorised under the mining lease) provided legislation and formal administrative policies are amended to resolve current ambiguity.

\(^1\) Lewin, J.L., Siriwardane, H.J. and Ameri, S., 1993: New perspectives on the indeterminacy of Coalbed Methane ownership. *Proceedings of the 1993 International Coalbed Methane Symposium, University of Alabama/Tuscaloosa, May 17-21, 1993*, 305-316. At p.311 Lewin et al conclude that: "The foregoing discussion has demonstrated the indeterminacy of coalbed methane ownership at common law." In Queensland the ownership of the CSM is not in doubt - coalbed methane is owned by the Crown and the Crown is competent to award the rights to produce and dispose of the coalbed methane as it sees fit. The issue in Queensland is therefore how the rights to access coalbed methane should be allocated in order to ensure the best overall outcome for the State.

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This "status quo" option would not directly address the issue of different legislative and regulatory requirements applying to similar operations conducted on a mining lease or an authority to prospect. However policy in relation to setting of lease conditions and acceptance of plans of operation could ensure adoption of common standards.

Recommendation 1: CSM activities continue to be conducted under either the *Petroleum Act* in the case of CSM exploration/production; or the a mining lease for coal under *Mineral Resources Act* (or relevant franchise agreement Acts) in the case of coal mining.

5.1.2 Health, safety and operational controls

Health and safety aspects of underground coal mining operations come within the scope of the *Coal Mining Act*. However it is less clear where the health and safety responsibilities for surface methane drainage operations within a coal mining lease lie: current advice is that such operations come within the *Coal Mining Act* if the methane is being extracted to improve mining conditions rather than for commercial gain, but that if the gas is used commercially the operations may not fall within the scope of that Act.

Recommendation 2: All methane drainage operations on coal leases

- be conducted in accordance with safety and risk management plans, approved and inspected under the *Coal Mining Act and Regulations*; and

- set operational standards equivalent to those required under the *Petroleum Regulations (Land)*;

CSM explorers have argued that the operational, health and safety requirements of the *Petroleum Regulations (Land)* are excessively onerous, given that CSM operations are generally conducted at relatively shallow depths, involving low pressure gas and small capacity drilling equipment. Clearly there is a case for different standards to be applied in terms of well completion requirements, pipeline standards and so forth.

However it is considered that the Regulations provide sufficient flexibility, by way of exemptions and specific approvals, to accommodate the particular requirements of CSM exploration without the need to establish separate regulations.

Recommendation 3: CSM exploration and production operations on titles granted under the *Petroleum Act* continue to be conducted in accordance with the requirements of the *Petroleum Regulations (Land)*.

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
Notwithstanding the above recommendation, there would be merit in developing a Technical Guideline for CSM Operations which would provide guidance to operators and to Government on sound operating practice. Such a document could provide a valuable reference point in considering approval of CSM programs under the Regulations.

**Recommendation 4:** Government and CSM explorers together develop Technical Guidelines for CSM Operations to provide guidance on sound operating practice.

### 5.2 Simultaneous Exploration Rights

The current mineral exploration title system in Queensland, while providing titleholders with exclusive rights to explore for designated minerals or petroleum, does not preclude other parties taking out exploration titles for different minerals over the same land. Thus it may be the case that two or more titles, each authorising exploration for different minerals, may be in force over the same land area at any particular time.

This doctrine of "simultaneous exploration rights" seeks to maximise exploration effort by allowing the full range of mineral potential in an area to be assessed.

The alternative would be to grant only one exploration title over any particular area of land, and to exclude all other explorers even though they may wish to search for different minerals. Such a system might be expected to result in a considerable reduction in aggregate exploration expenditure.

However the use of overlapping exploration titles creates a clear potential for conflict once exploration moves to development.

To illustrate this point, consider a situation where Company C holds an Exploration Permit for Coal (EPC) over an area which is also held by Company M under an Exploration Permit for Minerals. Assume that Company C has succeeded in identifying a coal resource suitable for opencut coal mining. Assume also that Company M has expended significant amounts of money proving up resources of oil shale which occur in association with the coal measures, but which are not yet mineable.

If Company C applies for and is granted a mining lease for coal over this area, the value of Company M's investment in exploration for oil shale in this area would be considerably reduced if not completely eliminated.

The *Mineral Resources Act* contains no requirement that Company M be compensated for this loss. Indeed under the Act as it stands, there is no requirement for a lease applicant to inform the holders of overlapping exploration titles of the fact that a lease application has been made. Under proposed amendments to the Act this situation will change, with lease applicants being required to advise other exploration titleholders of their intentions. The other titleholders, being so alerted, may choose to object to the grant of the lease.

--- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY ---
In the case of CSM, the gas resource will commonly be contained in coal seams of commercial value in their own right. In these circumstances, there is clearly a significant potential for either the coal miner or the petroleum explorer to suffer financial loss as a result of a successful lease application by the other party.

This issue needs to be addressed with appropriate arrangements to provide reasonable security for explorers. In this regard, the policy for CSM exploration and production titles needs to:

• preserve rights already granted;
• clarify the extent of those rights where necessary;
• ensure that any subsequent grant of title does not unduly disadvantage other titleholders.

Recommendation 5: In accordance with established principles of mineral law in Queensland, the practice of granting exploration permits for coal and authorities to prospect for petroleum over the same land continue, notwithstanding the potential which this creates for competing claims to CSM.

Recommendation 6: Conditions be included in all exploration and production titles for coal and petroleum to ensure that opportunities for coal and CSM explorers to realise benefit from their exploration investment are not unduly affected by grant of a production lease to another party (see Recommendations 18 and 19).

5.3 Rights to CSM within coal leases

Numerous questions arise regarding the rights of coal lessees in relation to access to CSM within their leases. For the purposes of this analysis it will be necessary to consider:

• coal leases already granted, without rights to gaseous hydrocarbons;
• coal leases already granted, with rights to gaseous hydrocarbons;
• future coal leases.

5.3.1 Basis for CSM activities on coal leases

CSM activities on coal mining leases are currently justified on the basis that they are conducted with the primary aim of improving operational conditions in the mine, and in particular enhancing the safety of future operations by reducing the concentrations of gas which will be encountered during mining.

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It is generally agreed by both coal miners and CSM explorers that it is necessary and desirable that coal miners be able to control gas in the proximity of mine workings.

**Recommendation 7:** It be recognised that coal mining lease holders have the right to produce and dispose of, but not automatically to use or sell, CSM from the coal mine precinct.

Where the petroleum exploration or production rights over the lease area are held by another party, the coal miner should be required to consult with the other party in developing plans for CSM drainage within the coal mine precinct.

**5.3.2 Rights to commercial use or sale of gas from coal leases**

CSM explorers and coal miners disagree on the question of whether a mining lease holder should be entitled to commercially dispose of any of the methane so produced.

CSM explorers have proposed that the rights of coal miners to extract gas should be limited to drainage reasonably necessary to allow safe conduct of current mining operations or of operations planned within a short period of time; and that the coal miner should have no rights to sell the gas.

Coal miners on the other hand believe that they should be entitled to produce and sell gas associated with coal seams anywhere on their leases; and that such rights should be automatically granted to the holder of a coal lease.

Both views lead to significant policy problems:

- The CSM explorers' proposals could reduce the opportunities for commercial utilisation of gas from coal mine precincts, and would prevent miners offsetting the cost of degasification operations with revenue earned from sale of gas.

  CSM explorers have argued that, whereas they can profitably extract gas in these situations, coal miners cannot and therefore allowing CSM explorers to produce and sell the gas in the coal mining leases in fact assists the coal miners. Coal miners do not accept this: they see that the CSM explorers wish to access the "profitable" gas and will leave the coal miners to carry out whatever additional degasification work may be required, without the commercial benefit of the profitable component of the gas.

- The coal miners view that rights to CSM should automatically vest in the coal lease holder involves the possibility of CSM explorers suffering uncompensated loss resulting from transfer of rights from an ATP holder to a coal miner upon grant of a coal mining lease.

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Despite the fact that gas occurs within the coal seams being mined, and production of the coal inevitably involves release of the contained gas, it does not automatically follow that the coal miner can sell the gas. A mining lease granted for mining coal does not authorise the production or sale of any other mineral.

In order to acquire the rights to sell gas from a mining lease, it is necessary for the lessee to apply to have the mineral "gaseous hydrocarbons" included on the lease.

Such approval may be sought under section 7.53 of the *Mineral Resources Act* which allows the lease holder to apply for other minerals (including methane) to be included as approved minerals under the lease.

In the case of leases granted under the *Theiss Peabody Mitsui Coal Pty Ltd Agreement Act*, gaseous hydrocarbons have been included as an approved mineral as a result of a variation of Special Conditions pursuant to section 32A of the *Mining Act* to provide that:

"Extraction of Gaseous Hydrocarbons shall not be undertaken other than in accordance with an approved scheme which shall address details of the method of extraction, storage, disposal or use as appropriate to the operation."

A subsequent approval pursuant to Section 35 of the *Mining Act* allowed that gaseous hydrocarbons be included in the minerals which could be mined under the leases.

**Recommendation 8:** Use or sale of gas produced by a coal miner from CSM drainage operations within a mining lease require authorisation by inclusion of "gaseous hydrocarbons" as an approved mineral under the lease.

The disposal, use or sale of CSM may incur a liability to pay royalty in accordance with the relevant provisions of the *Mineral Resources Act and Regulations*.

**5.3.3 Status of existing "gaseous hydrocarbon" rights in coal leases**

The question needs to be answered whether or not the existing rights of coal miners where gaseous hydrocarbons have been added to the approved minerals under the lease should be preserved.

CSM explorers have proposed that commercial gas rights granted to coal lessees should be revoked.

This proposal raises the issues of compensation (particularly where the coal miner has acted in reliance on that right) and perceptions of "sovereign risk".

It is considered that allowing coal miners to produce and sell gas incidental to their mining operations meets the policy objective of maximising utilisation of the available resources.

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resource, and in view of the questions of compensation and sovereign risk which would otherwise arise, it is proposed that existing rights be maintained.

Recommendation 9: Where existing coal mining leases already contain provisions authorising the extraction and disposal by sale of gaseous hydrocarbons, those provisions be reaffirmed.

5.3.4 Extent of rights where "gaseous hydrocarbons" have been added to the lease

The next question to be addressed is whether the inclusion of gaseous hydrocarbon rights on a mining lease should entitle the holder to all of the gas within the entire lease area.

Two basic interpretations may be considered, namely:

- rights are restricted to drainage operations within a specified distance of the current workings, or to the area proposed to be mined within a specified period of time (possibly "within the period of the current Plan of Operations");

or

- gas may be produced from all of the coal seams within the lease.

The argument in favour of restricting the drainage operations is that under the definition of "mineral" in the Mineral Resources Act, CSM can only be considered a mineral if a nexus to current or future mining operations is established. In the absence of such a nexus, methane could not be considered a mineral and therefore production could not be authorised by a mining lease.

The argument in favour of including all CSM within the lease is that all of the coal within a mining lease may be regarded as intended for future mining by virtue of the fact that the Warden, in recommending grant of the lease has certified as to the appropriateness of the size and shape of the lease to the purposes for which it was sought. Any gas produced from coal seams within the lease would thereby satisfy the test of enhancing the safety of future coal mining operations and so satisfy the definition of "mineral".

Setting a limit on the radius of drainage from current workings is regarded as an unfavourable option because any such limit would be arbitrary and would not address the efficiency of resource recovery.

Limiting extraction by reference to an approved plan of operations would be relatively easy to enforce within the existing planning framework. However, such an approach raises intractable questions regarding title to the remainder of the gas within the lease.

Would the remnant gas be held in a type of administrative limbo whereby it is initially unavailable to the coal lessee but subsequently becomes available as the mine progresses?

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If so, the argument is purely academic and should be resolved in favour of the coal miner.

However if this is not the case, and the lessee is denied eventual access to gas which would otherwise under the provisions of the lease already granted have become available to extract and sell, the issues of compensation and sovereign risk arise.

If the remnant gas within the lease is deemed to be available for the CSM explorer, different problems arise.

In the first place, it may well be (and the situation already exists within the Bowen Basin) that the coal lease is adjoined by more than one ATP held by different parties. Who then should have access to the remnant gas within the lease?

Second, the boundary of the area legitimately accessible by the coal miner would be constantly moving as plans of operation were updated. Thus if access to the remnant gas within the lease had been granted to a CSM explorer, then either the title to some of that gas would progressively revert to the coal miner, or the coal miner would have to be denied access to any gas other than that covered by the first plan.

It therefore appears that the restrictive interpretation is unworkable.

The preferred interpretation is that all of the gas within the mining lease is available to the lessee if "gaseous hydrocarbons" have been added to the lease.

This view is supported by legal advice available to the Department of Minerals and Energy, to the effect that, where a coal miner has had "gaseous hydrocarbons" added to the mining lease, that miner is entitled to remove the gas from all the coal seams occurring within the lease areas on the basis either that the gas is necessarily produced by or in connection with coal mining or that all the coal within the lease is intended for future mining.

**Recommendation 10:** Where a coal mining lease includes rights to produce gaseous hydrocarbons, those rights be interpreted as extending to all of the hydrocarbons occurring in or in association with coal seams within the lease.

*5.3.5 Future grant of "gaseous hydrocarbon" rights in coal leases*

CSM explorers have opposed the grant of further applications for the inclusion of "gaseous hydrocarbons" on coal mining leases.

However coal miners need to be able to control gas within the mine precinct. Recognising the greater value of the coal resource, it seems desirable to allow any profit associated with the production of such gas to contribute to the economics of recovering the total resource.
It is therefore proposed that applications by coal miners for inclusion of "gaseous hydrocarbons" as an approved mineral under the lease should generally be supported. However, the question whether or not to approve such applications should also take account of any rights to CSM previously granted to another party by virtue of an exploration or mining title under the Petroleum Act. If a petroleum ATP or Petroleum Lease existed in the area prior to grant of the mining lease, then inclusion of "gaseous hydrocarbons" as an approved mineral on the lease would amount to an uncompensated resumption of those rights from the CSM explorer. It is proposed that in these circumstances the application for inclusion of "gaseous hydrocarbons" in the mining lease should not be approved.

Recommendation 11: Departmental Policy be that applications by coal mining lease holders under section 7.53 of the Mineral Resources Act for inclusion of "gaseous hydrocarbons" on their leases be supported if rights to CSM have not already been granted to another party by virtue of an exploration or production title issued under the Petroleum Act, but be refused if such prior rights exist.

5.4 Rights to CSM within Authorities to Prospect

Questions which arise in relation to the rights to CSM in an Authority to Prospect include:

- Should existing distinctions between CSM and "conventional" gas be maintained?
- Should the limitation on CSM operations in shallow coal be maintained?
- Do current restrictions prevent CSM explorers from operating in all coal mining leases, or only those in existence at the time of grant of the ATP?
- Do the restrictions on CSM activities in coal mining leases mean that those leases are not a part of the ATP, or merely that CSM activities within those parts of the ATP are restricted?

5.4.1 Basis for CSM activities on an Authority to Prospect

The Petroleum Act provides for exploration for all "petroleum " as defined in that Act. The title under which such exploration is conducted is an Authority to Prospect (ATP). Grant of an ATP generally conveys to the holder the exclusive right to explore for petroleum within the area covered by the title.

The Petroleum Act does not distinguish between CSM and "conventional" hydrocarbons. However it has been the practice to include in the Authority to Prospect (ATP) document

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a special provision relating to CSM when the ATP holder has indicated an intention to carry out CSM investigations.

ATPs for conventional petroleum are generally granted with a standard set of conditions describing the rights and obligations of the holder. Each ATP document contains a Schedule which specifies the lands contained within the ATP and any exclusions therefrom.

In the case of ATPs for which the work program includes CSM exploration, an exclusion clause in the following form is generally included in the schedule to lands covered by the ATP:

"Exclusive of mining leases for coal, and coal shallower than a depth of 300m below ground level, unless otherwise approved. Petroleum exploration within a mining lease for coal would require the agreement of the lessee of that mining lease."

There have been some variations to the wording of this exclusion clause in the various ATP's which have been granted for coal seam methane, the most significant of which is that the early versions generally referred to "current mining leases for coal" whereas the more recent wording refers to "mining leases for coal". CSM explorers have expressed concern that the latter wording would result in all coal mining leases being excluded from the ATP, even when the ATP was in existence prior to the grant of the lease. This would in effect amount to an uncompensated resumption of land from the ATP.

This concern is addressed in part by Recommendation 11, which proposes that rights to gaseous hydrocarbons not be granted for mining leases if there is a pre-existing petroleum title over the area. The basis of that Recommendation is that the prior rights of the ATP holder should be preserved. Following the same line of reasoning, a clear statement is required that grant of a mining lease does not result in the lease area being excluded from a pre-existing ATP.

Recommendation 12: Where a mining lease is applied for over an area already covered by an ATP, grant of the application will not result in the area of the lease being excluded from the ATP.

As a corollary, the grant of a Petroleum Lease over a pre-existing exploration permit for coal (EPC) should not result in the area of the lease being excluded from the EPC.

5.4.2 Status of pre-existing lease land

The clause excluding coal leases for ATPs has generally been included within the Schedule of Land to which the ATP applies, rather than in the body of the conditions of the ATP. However the fact that it includes a restriction on the scope of operations (the 300m depth limitation) suggests that, rather than representing an exclusion from the ATP of land comprised within a coal mining lease, the clause may be better characterised as a

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
restriction on the activities which the ATP holder may undertake within that land. If this is the case, then the mining leases form part of the ATP, albeit a part over which the ATP holder has no rights to operate. Legal opinion on this issue is inconclusive.

Since it is intended that the holders of coal leases which predate petroleum titles be able to have "gaseous hydrocarbons" added to their leases and thereby to produce and sell gas associated with coal seams throughout the lease (see Recommendations 10 and 11), a declaration is required to the effect that pre-existing mining leases are excluded from the land comprising an ATP.

Recommendation 13: The restrictions on access to CSM currently contained in existing ATPs be altered by deleting the current exclusion clause and replacing it with an exclusion contained in the Schedule of Land to the following effect:

"Exclusive of the land contained within Mining Leases No.xxx, yyy, zzz, being mining leases for coal current at the date of grant of this Authority, for as long as those leases or any titles arising from them continue to subsist.

In the case of an ATP arising from the conditional surrender of one or more pre-existing ATPs, the relevant dates should be the dates of grant of the original titles.

As a corollary, any Petroleum Lease in force at the time of grant of an EPC should be excluded from the EPC unless the petroleum lessee agrees otherwise. Thus coal exploration operations would generally be excluded from the area of existing Petroleum Leases.

Recommendation 14: The conditions of any Exploration Permit for Coal covering a pre-existing Petroleum Lease be amended by excluding the Petroleum Lease from the Schedule to Land comprising the Exploration Permit.

However it may be to the coal miner's advantage to allow exploration and production of CSM by the holder of an adjoining ATP. This may prove to be, in certain circumstances, a better option for the coal miner than themselves dealing with problems of gas drainage. The administrative system needs to be sufficiently flexible to accommodate such negotiated arrangements.

Similarly, a petroleum lease holder may be willing to allow coal exploration to proceed within the area of the petroleum lease, and may reach agreement with the holder of an adjacent exploration permit for coal on a basis for such work proceeding.
Recommendation 15: The exclusion of pre-existing coal leases from an ATP, or Petroleum Leases from an Exploration Permit for Coal, may be waived with the agreement of the lessee.

5.4.3 Subsequent grant of a coal mining lease

Should a coal mining lease be issued over a part of a pre-existing ATP, the ATP holder should retain the right to conduct CSM operations within the area of the new lease, with a view to the identification of commercially viable gas resources and subsequent application for a Petroleum Lease (see Recommendation 12).

However the ATP holder should not be permitted to unreasonably interfere with or to restrict coal development, and should be required to co-operate in enabling the coal mine lessee to undertake any predrainage scheme which may be necessary for effective coal mine development (see Recommendation 18).

This could involve the ATP holder in:

• carrying out the work on behalf of the coal lessee, or
• allowing the coal lessee to conduct the work (in effect making the coal lessee a farminee to the ATP), or
• negotiating a basis for joint development of CSM within the new mine lease area.

In these circumstances, the basic right to commercially utilise the CSM resource should rest with the petroleum explorer.

As a corollary, if a Petroleum Lease is issued over a part of a pre-existing EPC, the EPC holder should retain the right to conduct coal exploration operations within the area of the new Petroleum Lease, with a view to the identification of commercially viable coal resources and subsequent application for a mining lease for coal.

However the EPC holder should not be permitted to unreasonably interfere with or restrict petroleum development, and should be required to co-operate with the petroleum lessee with regard to any CSM extraction scheme (see Recommendation 19).

Similarly, any Petroleum Lease issued over a pre-existing EPC should be subject to a condition that the lessee not unreasonably interfere with or restrict coal exploration operations within the lease area.
5.4.4 Restrictions on access to CSM in shallow seams

The prohibition on CSM activities in coal shallower than 300m was designed to keep CSM explorers and coal miners at "arm's length", by restricting the activities of CSM explorers to areas less likely to be required for mining purposes. However the restriction poses a number of problems. For example:

- it is common for coal seams in the Bowen Basin to occur at more than one stratigraphic level. Thus a CSM explorer may intersect shallow coal seams at less than 300m while legitimately testing deeper seams.

- gas, whether from coal seams or other sources, may occur in conventional reservoirs at shallow depths. It then becomes a matter of technical interpretation regarding the source of the gas in order to determine whether or not the ATP authorises access to the gas.

It is proposed (see Section 5.4.3) that CSM explorers holding an ATP have priority to commercial rights to CSM provided their title predates any coal mining lease over the same land. It follows that no other party in these circumstances has claim to commercial rights to any of the gas within the ATP area. The restriction on CSM activities in coal seams shallower than 300m should therefore be discontinued. This is reflected in the wording of the exclusion clause proposed in Recommendation 13.

Recommendation 16: Authorities to Prospect provide the holder with rights to all gas, whether conventional or CSM, in the ATP area irrespective of depth.

5.4.5 Protection of coal resources

Removal of gas from deeper coal seams by CSM production activities has the potential to significantly enhance the prospects for future mining of those resources.

However coal miners have expressed concern that CSM operations, particularly those aimed at stimulating coal seam reservoirs to improve gas flow rates (for example, hydrofracturing, cavity completion, chemical treatments to remove minerals from cleat) could adversely affect future mining conditions.

In approving specific CSM programs, the Government should therefore weigh up these two factors. When proposing particular programs of CSM exploration, flow testing, stimulation and completion, the onus should be on the CSM explorer to provide evidence of the acceptability of the proposed treatments in terms of impact on future mineability of the coal.
Recommendation 17: In considering requests for approval of specific CSM exploration, testing and production programs, the Government take account of the likely impact on future mineability of the coal.

5.4.6 Rights to production titles for CSM

The holder of an ATP will be entitled to apply for and have granted a Petroleum Lease over any petroleum discovery declared commercially viable, in accordance with the normal provisions of the Petroleum Act.

5.5 Rights to CSM within exploration permits for coal

The holder of an exploration permit for coal (EPC) will generally have no rights to CSM, but should be permitted to test gas composition and gas content of coal seams, as required for planning of future mining operations.

5.6 Negotiation requirements

The preservation of prior exploration rights (both coal and CSM) in areas subsequently taken to a coal mining lease or a petroleum production lease, as proposed in Recommendation 12 will introduce requirements for negotiation between both parties to ensure that neither is unreasonably impeded in the pursuit of their legitimate interests in the area.

For example, it will be necessary to ensure that where a CSM explorer has pre-existing rights to gas in a coal lease area, the efficient and safe extraction of the coal is not hindered by a refusal on the part of the CSM explorer to negotiate reasonable terms and conditions for the removal of gas from the mine precinct.

As a corollary, an obligation should be placed on the coal miner in these circumstances to negotiate in good faith with the CSM explorer to allow CSM activities to continue provided they do not unduly interfere with coal mining operations.

Obligations to negotiate in good faith should be included in all coal and petroleum titles. In the event of a failure of these negotiations, powers should be available to allow the Minister to authorise the production and disposal, by sale or otherwise, of gas from within the mining lease.

Recommendation 18: Every petroleum authority to prospect and every petroleum lease contain conditions requiring the holder to negotiate in good faith with the holder of any coexisting coal mining lease to enable gas levels in the mine precinct to be reduced to safe and efficient operating levels.

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
Recommendation 19: Every exploration permit for coal and every mining lease for coal contain conditions requiring the holder to negotiate in good faith with the holder of any coexisting petroleum title to allow CSM activities to continue on a basis which does not unreasonably interfere with the coal mining operations.

It will be necessary to have a mechanism available to deal with situations where negotiations break down. Such situations could be dealt with either by providing recourse to a judicial determination through the Warden's Court, or by allowing the Minister to determine the matter.

It is suggested that the use of Ministerial discretion may be preferable in that it could help to avoid reliance on legal means to address matters which should be resolved wherever possible by negotiation.

Recommendation 20: In the event that negotiations referred to in Recommendations 18 or 19 above break down, the Minister be given power to authorise CSM exploration or production activities on the mining lease, and to determine the terms and conditions under which such activities may occur.

5.7 Required amendments to legislation

To give clear effect to the interpretations contained in Recommendations above, it will be necessary to modify the definitions of "mineral" and "petroleum" in the appropriate Acts.

Recommendation 21: The definition of "mineral" in the Mineral Resources Act (section 1.8) be altered to include:

"hydrocarbons occurring in association with shale or coal the subject of a mining lease except where such lease lies upon an exploration or production title previously granted under the Petroleum Act."

Recommendation 22: The definition of "petroleum" in the Petroleum Act be modified to exclude gaseous hydrocarbons as redefined in the Mineral Resources Act.

The powers of intervention proposed in Recommendation 20 will require appropriate amendments to legislation.

Recommendation 23: The Mineral Resources Act be amended to allow that, if the Minister is satisfied that:

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
the holder of an exploration or production title under the *Petroleum Act* which is coincident with a mining lease for coal has been unable to negotiate with the lease holder reasonable terms and conditions for conducting petroleum exploration or production activities normally authorised under such title; and

such activities can reasonably be conducted without undue detriment to the mining activities on the lease

then the Minister may grant the petroleum title holder permission to conduct such activities, and may determine the terms and conditions under which they shall be conducted.

**Recommendation 24:** The *Petroleum Act* be amended to allow that, if the Minister is satisfied that:

- the holder of an exploration or production title under the *Mineral Resources Act* which is coincident with a petroleum lease has been unable to negotiate with the lease holder reasonable terms and conditions for conducting coal or mineral exploration or production activities normally authorised under such title; and

- such activities can reasonably be conducted without undue detriment to the petroleum production activities on the lease

then the Minister may grant the coal or mineral title holder permission to conduct such activities, and may determine the terms and conditions under which they shall be conducted.

In Recommendations 23 and 24, the exercise of Ministerial discretion would be guided by Departmental advice prepared in accordance with formal statements of Departmental Policy setting out appropriate criteria.

6 COMMERCIAL ISSUES

Companies involved in CSM development have requested financial support from the Government to overcome the difficulty associated with the high front-end expenditures required in exploration and development and the time required to establish long term markets. The types of financial support requested include royalty and payroll tax holidays, lower pipeline tariffs or tariff holidays for use of the State Gas Pipeline, and special gas purchase arrangements with the Queensland Electricity Commission.

Further consideration of these requests is required. To date insufficient information has been submitted by companies to enable the rigorous assessment of these requests required under the existing Government policy framework.

-- DISCUSSION DRAFT ONLY - NOT GOVERNMENT POLICY --
In dealing generally with the question of assistance, the Government follows a policy of "market enhancement" aimed at creating an efficient and effective operating climate for business involving minimum Government interference with prices and commercial decision making. The objective is to encourage long term sustainable competitiveness rather than short term assistance.

Nevertheless, there is room under the policy to provide direct assistance to sectors or projects where net economic benefits can be demonstrated. Such assistance is to be subject to rigorous assessment and will be the exception rather than the rule.

In general the Government does not favour royalty holidays. However, the Government is prepared to consider providing special royalty arrangements for CSM projects which will take into account the high initial development costs. As a first step in this process the Government would need to be satisfied as to the long term economic viability of the production of CSM. To undertake such an assessment the Government would require the cooperation of prospective CSM producers in supplying an appropriate level of project data.

The proposed administrative arrangements allow coal miners to produce CSM in commercial quantities from their coal lease. The royalty payable under the Mineral Resources Act for such gas will be the same as that paid by petroleum producers under the Petroleum Act.