Submission to the Victorian Parliamentary Commission: Onshore Unconventional Gas Regulation: *Land Access, Compensation and Environmental Management*

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Objective:

To assess and review the existing regulatory and policy framework in Victoria for unconventional gas development and to consider how that framework may be strengthened to respond more effectively to the core social and environmental concerns impacting Victoria.

Scope: This submission has identified four core areas of community and environmental concern relevant to the extraction and production of unconventional gas resources in Victoria.

1. Existing land access arrangements between private landholders and mining proponents and how those arrangements might be better coordinated.
2. The scope of existing compensation entitlements for private landholders and the methodology for assessing and negotiating such entitlements between mining proponents and private landholders. This section will evaluate how to improve existing mechanisms for conflict resolution.
3. The nature and scope of resource conflicts between domestic and agricultural land usage and onshore unconventional gas and an overview of how such

conflicts might be better managed for future co-existence.

4. The regulatory and policy safeguards needed to enable onshore unconventional gas exploration and development. This section evaluates the environmental assessment and management processes needed to properly address the dangers associated with unconventional gas extraction. Consideration is given to the best and most effective way in which monitoring, enforcement and impact mitigation responses may be incorporated into the assessment and approval of resource titles.

Relevant Concerns

The issues covered by this submission have a strong community focus because they highlight the risks and challenges connected with unconventional gas development in Victoria, the deficiencies connected with the existing regulatory framework and proposals for improving these deficiencies.

This area is the subject of diverse and conflicting industry, community and environmental concerns that include:

1. The fact that the supply of gas from unconventional onshore gas sources in the Eastern states of Australia has expanded to meet rising domestic and international energy demands. Gas from unconventional resources is increasingly important because of rising demand. Gas is regarded as a transition resource as we shift towards a lower carbon economy because it has lower emissions

than coal. In light of this, it is important to appreciate the significant economic opportunities that accessing unconventional gas resources will generate (should appropriate resources exist in Victoria).

2. The need to ensure that the domestic price of gas remains competitive when and if supply is increased. Increasing supply (along with other market measures) will assist this process (as articulated within the Federal Energy White Paper).
3. The importance of ensuring that, should onshore unconventional gas development proceed in Victoria, the regulatory requirements for the environmental and social assessment and issuance of unconventional gas titles is responsive to community expectations. Maximising community engagement and approval is best achieved by introducing an optimal framework for information transparency so that communities are given the opportunity not only to understand the nature and scope of proposed projects and their potential social and environmental impacts, but also to respond to those issues in a fair and reasonable manner.
4. Improving the regulatory framework for land access and resource conflict between private landowners and resource proponents. The public resource framework, which exists in Australia, is grounded in the core land framework inherited from England. The state in right of the Crown is the owner of all sub-surface resources, which enables the state to issue resource titles that confer upon the holder a right to explore or extract. Access entitlements represent the interface between private land ownership and state resource ownership. Creating a framework where access entitlements are regulated with due regard to the ownership rights of private landholders is crucial. This framework must be

capable of providing a clearer articulation of the boundaries and entitlements connected with overlapping property interests in order to reduce conflict and promote future co-existence.

5. The need to ensure that internationally recognized principles of ecologically sustainable development are more effectively integrated into the approval and management processes for unconventional gas titles at the State level. These processes are crucial for the proper implementation of a robust environmental review process.
6. The importance of implementing robust monitoring through the creation of environmental review processes capable of responding to new technological advancements, such as hydraulic fracturing and horizontal drilling, which are connected with unconventional gas extraction.
7. The need to ensure that associated and interconnected agricultural industries and other land use sectors likely to be impacted by the extraction and production of unconventional gas, particularly agricultural industries, are appropriately protected. This requires the implementation of regulatory processes better able to implement co-existence strategies and monitor social and environmental reconciliation processes.

This submission will recommend regulatory reforms, improved processes and best practice standards for onshore unconventional gas development in Victoria. The fundamental object is to improve the accountability and performance of public sector departments directly connected with the assessment, issuance and management of unconventional gas titles and to improve the negotiation and conflict resolution processes between stakeholders, notably mining proponents and private landholders.

1. Unconventional Gas in Australia

Unconventional gas is a generic reference to all natural gas that is recoverable from what are known as 'unconventional' gas reservoirs. The term encompasses gas from coal seams, shale rock and tight rock formations.

(i) Coal Seam Gas

Coal seam gas, known as coal-bed methane internationally, is a non-renewable energy resource that is a by-product of coal.[1] Coal forms when plant material is 'coalified' into lignite, sub-bituminous coal, bituminous coal and anthracite coal.[2] At different stages during the coalification process, biogenic and thermogenic methane forms.[3] Much of this methane escapes to the surface or migrates into the surrounding rock. A portion remains trapped within the micro-pores of the coal in areas known as coal cleats or seams. Naturally occurring water contained within the coal seams creates pressure that holds the methane gas in place. The methane gas contained within the micro-pores of the coal is regarded as a 'pure gas' in the sense that it is non-toxic and contains very few impurities.[4] In order to extract the gas from the coal seam, it is necessary to remove the water holding the gas in place. Removing the water drops

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1 The first serious research regarding coal bed methane production in the United States occurred in the 1970's when the U.S. Bureau of Mines and United States Steel Corporation (U.S. Steel) developed a test project in the Black Warrior Basin in Alabama. For an outline of this see: R.A. Schraufnagel, 'Coalbed Methane Development Faces Technology Gaps' (1990) Feb. 5, *Oil and Gas Journal* 48. See also E. A. McClanahan, 'Coalbed Methane: Myths, Facts and Legends of its History and The Legislative and Regulatory Climate into the 21st Century' (1995) 48(3) *Oklahoma Law Review* 471 at 473

2 See E.A. Craig and M.S. Myers, 'Ownership of Methane Gas in Coalbeds' (1987) *Rocky Mountain. Min. Law Inst.* 767 at 782.

3 See I. Gray, 'Reservoir Engineering in Coal Seams: Part 1 – The Physical Process of Gas Storage and Movement in Coal Seams' SPE Reservoir Engineering (February 1987) esp at pp 28-34 where the formation of methane is discussed.

4 See the discussion by D. Mathew, 'The Nature of Gas in Coal: Technical Challenges of Co-Location of Coal and Coalbed Methane' (2005) *Australian Mineral and Petroleum Association Yearbook* 368 at 369.

the pressure in the seam thereby allowing the gas to be captured.

Removing the water is generally achieved by pumping the water out of the aquifer.[5] The extracted water contains varying levels of contamination and salinity. The 'removed water' known as 'associated water', is an important aspect of the extraction process and, if not disposed of properly, can generate significant environmental concerns.[6] CSG was mainly sought within the Permian coal seams of the Bowen and Sydney Basins. It has also occurred in the relatively shallow depths of the lower rank coal seams of the Jurassic age Surat and Clarence-Moreton Basins in Queensland. These latter seams have less gas content than high rank Permian age coal but are more permeable which means CSG can be more easily desorbed (or extracted), resulting in higher recovery factors. Brown coal (or lignite) of Tertiary age also has become a focus for CSG exploration in the Otway Basin in Victoria. Exploration in Queensland continues to concentrate in the Bowen, Galilee and Surat basins while in New South Wales exploration continues in the Sydney, Gunnedah, Gloucester and Clarence-Moreton basins. Other prospective basins include the Cooper, Pedirka, Murray, Perth, Ipswich, Maryborough, Gippsland and Otway basins. CSG is also being explored in South Australia, Tasmania, Victoria and Western Australia. The current high levels of exploration have significantly increased known resources: in mid-2011 2P reserves are now over three times higher than in mid-2008.

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5 For a detailed discussion on the processes involved in CSG extraction see K.J. Flaherty, ''Quandary or Quest: Problems of Developing Coal Bed Methane as an Energy Resource' above n.7 at 73.

6 See the discussion by T. Nunan, 'Legal Issues Emerging from the Growth of the Coal Seam Gas Industry in Queensland' (2006) 25 *Australian Resources & Energy Law Journal* 189 at 190 where the author notes that unlike water extracted by a landowner via a water bore, 'associated water' is considered to be a regulated waste in Queensland, following the introduction of the *Water Supply (Safety and Reliability) Act* 2008 (Qld), s201A.

(ii) Shale Gas

Shale gas is found in low permeability rocks at depths of 1000 to 2000 metres. Shale gas extraction differs to coal seam gas extraction because of the variability of the shale reservoir. Shale is much denser and harder than coal seam, it is located deeper in the strata and it is more impermeable. The quality of a rock is determined by its 'porosity' and its 'permeability'. Porosity refers to the void space that exists between the grains and thus references the capacity of the rock to contain fluids. The permeability of the reservoir refers to the rocks ability to permit the flow of oil or gas. The unit of permeability measurement is known as the 'darcy'.

The low permeability of shale means that the extraction process will always involve horizontal drilling and hydraulic fracturing processes in order to mobilize the gas. Some gas shales can have as little as one thousandth of the permeability of tight gas formations.

The Australian Council of Learned Academies 2013 (ACOLA) indicated that Australia may have more than 1000 trillion cubic feet (tcf) in recoverable shale gas. Australia has several basins of potential shale oil and gas reserves, the largest being the Canning basin in the north of Western Australia, the Georgina and Beetaloo basin in the Northern Territory and western Queensland and the Cooper Basin, in central Australia.

Both the smaller Perth Basin and the Maryborough basin, on coastal Queensland, host potential reserves, and the report noted. Both are the nearest to population centres, although both occupy smaller areas.

The Cooper Basin, with its existing gas processing facilities and transportation infrastructure, is likely to be the first commercial source of shale hydrocarbons.

(iii) Tight Gas

Tight gas is also found in low permeability rock at depths below 1000 metres. The pores that contain the 'tight gas' are ultra-compact that sharply limit migration. Tight gas reservoirs are more compact than brick and can contain a permeability of just a few dozen micro-darcy. Reserves of tight gas are predicted to exist in the Gippsland and Otway basins.

2. Expansion of Unconventional Gas: A Comparative Overview

The expansion of the unconventional gas industry in Australia has been particularly concentrated in the Eastern states, where the number of drills has dramatically increased over the last five years.[7] Given the significant reserves estimated to exist in this area, further expansion is likely to continue as international demand for liquid natural gas (LNG) in the export market increases.[8]

The advantages that unconventional gas offers, as a new, abundant and relatively less pollutant form of fossil fuel are strong factors driving the growth of the industry.[9]

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7 In Queensland it is estimated that there is 39,954 pj CSG Reserves. By 2012, 3500 wells existed in Queensland alone, with 1070 wells being drilled in 2012 alone. See the report prepared by the Australian Petroleum, Production and Exploration Association, 'An Introduction to the CSG Industry': http://www.appea.com.au/about/appea.html

8 Over the next five years, Australia's LNG (Liquid Natural Gas) exports are projected to increase at a rate of 19 per cent a year, underpinned by a number of new projects under construction. The value of Australia's LNG exports is also expected to more than double from $8 billion in 2009/10 to $18.5 billion in 2015/16, an average annual increase of 15 per cent. The Australian LNG industry is aiming to export 60 million tonnes of LNG by 2020. These figures are set out in the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) Energy Update, 2011.

9 See the discussion by K.J. Flaherty, ''Quandary or Quest: Problems of

These are particularly attractive features given the impact of climate change initiatives and the increasing phenomenon of LNG as a global commodity. The export value of the LNG industry in Queensland has increased more than fourfold and, according to a report issued in February 2012, approximately 3,500 wells now exist in Queensland alone. [10]

Victoria is Australia's second largest producer of conventional gas after Western Australia. Most of Victoria's gas comes from the Gippsland basin, with some coming from the Otway basin, and only a minor amount coming from the Bass basin. A large proportion of the Gippsland and Otway basins are located offshore, with a lesser portion located onshore. The Bass basin is entirely offshore in Bass Strait. The significant offshore resources and infrastructure for conventional gas in Victoria has meant that there has been a lack of impetus to progress onshore gas development.[11]

Coal seam gas reserves have been production in Queensland since 1996 in the Bowat and Surat Basins and, more recently in New South Wales in the Sydney Basin.[12] The first

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Developing Coal Bed Methane as an Energy Resource' (2000) 15 *Journal of Natural Resources and Environmental Law* 71 at 76 where the author outlines the fact that because coal bed methane can be found virtually wherever coal exists, and because of the vast quantities that are estimated to exist within coal rich areas, commercial exploitation has proceeded ahead of regulatory protection. For a more recent discussion on the advantages of CSG development see: Michael Roarty, 'The Development of Australia's Coal Seam Gas Resources (Background note, Parliament of Australia, July 2011) noting that the development of CSG deposits in Queensland and New South Wales associated with the coal fields will not only enable the supply of natural gas for the growing Eastern Australian market but also enable the establishment of major export liquefied natural gas (LNG) industries, providing an impetus to employment, infrastructure investment and Australia's exports.

10 It is estimated that today CSG comprises 90% of Queensland gas production. See the report prepared by the Australian Petroleum, Production and Exploration Association, 'An Introduction to the CSG Industry' at http://www.appea.com.au/about/appea.html

11 See Victorian Gas Taskforce Report (2013) Gas Market Taskforce Final Report and Recommendatons, 12-13.

12 The Queensland regulatory regime commenced in 2005. See K. Grover, ' A Conceptual Comparison between Unitisation under Australian Petroleum Legislation and Coordination under the Petroleum and Gas (Production and Safety) Act 2004 (Qld) (2005) 24 *Australian Resources and Energy Law Journal* 331.

commercial production of shale gas commenced in the Cooper Basin in October 2012 by Beach Energy. Tight gas is yet to be produced. There is, at this stage, no commercial production of unconventional gas in Victoria although to date, approximately 16 exploration licences have been issued. Lakes Oil holds exploration licences for shale gas in the Otway region.

(i) Hydraulic Fracturing

In some situations, the extraction process may involve the artificial stimulation of coal seams through a process known as hydraulic fracturing.[13] Hydraulic fracturing is a method of drilling that increases extraction levels by fracturing or cracking the coal seams that contain the gas. Once the seam is fractured, it is injected with a combination of water, sand and chemicals. After the fracture is created, the injection ceases and the water flows back into the wells. The sand from the injection remains in the fractures thereby allowing them to remain open. The gaps created by the sand allow for an increased flow of gas into the well bore. [14]

Hydraulic fracturing increases the commercial benefits of CSG extraction however it is not routinely used for CSG mining.[15] In both New South Wales and Queensland, the percentage of CSG mining using hydraulic fracturing is low as the technology is primarily utilized for other forms of unconventional gas mining such as shale gas.[16]

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13 For a detailed discussion on the process of hydro-fracturing see: L.H. Burney & N.J. Hyne, 'Hydraulic Fracturing: Stimulating your Well or Trespassing' (1998) 44 *Rocky Mountain Minnesota Law Institute* 19 at 22.

14 See L.H. Burney & N.J. Hyne, 'Hydraulic Fracturing: Stimulating your Well or Trespassing' above at p.22.

15 Hydro-fracturing is more commonly associated with shale seam gas extraction than CSG because the increased density of shale makes fracturing an important element of extraction. For further discussion see M. J. Laffin, 'Legal Considerations in the Development of Coalbed Methane' (2001) 39(1) *Alberta Law Review* 127 at 129.

16 Only 5% of CSG drills in Queensland and NSW actually utilized hydro- fracking technology. See R. Wilkinson, APPEA 'Our Gas Future' Paper

In Queensland, the coal seam gas industry has been operational since 1996 and has experienced a remarkable growth over the last decade.[17] In New South Wales, the most active CSG drilling has occurred in the Hunter region, the Gloucester Basin, the Gunnedah Basin, the Southern Coalfield (near Camden) and the Clarence Moreton Basin in North Eastern New South Wales. More limited exploration activity has occurred in Illawarra, Central Coast and Sydney.[18]

The International Energy Agency has predicted that resource intensive countries are entering into what is described as the 'golden age of gas'.[19]

Comparative global figures for shale gas reserves are:

Shale gas recoverable reserves (trillion cubic feet)

1. China 1,115
2. Argentina 802
3. Algeria 707
4. US 665
5. Canada 573
6. Mexico 545
7. Australia 437
8. South Africa 390
9. Russia 285
10. Brazil 245

World Total 7,299

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presented July 2013 at the Natural Gas and Fracking Conference, Sydney.

17 See L. Letts, 'Coal Seam Gas Production – friend or foe of Queensland's water resources?' (2012) 29 *Environmental and Planning Law Journal* 101.

18 See the New South Wales Legislative Council, General Purpose Standing Committee No. 5, Inquiry Into CSG, above n.2 at p. 32.

19 The 'golden age of gas' comes from International Energy Agency (IEA), *World Energy Outlook 2011: Are We Entering a Golden Age of Gas?* (2011).

3. Community, Ownership and Resource Conflict Overview

The progression of the unconventional gas industry in Australia has prompted significant social and environmental concern.[20] These concerns have been well documented. In her final report, the New South Wales Chief Scientist indicated that the significance of water and environmental health to the livelihoods of affected communities has made coal seam gas development a particularly emotive social concern and which necessitates a robust approach to regulation.[21]

Unconventional gas expansion has resulted in the issuance of petroleum titles over land previously disconnected with mining.[22] As petroleum proponents continue to expand into new frontiers for resource exploitation, the conflict between land and resource usage has become increasingly pronounced. Deep-rooted schisms exist between the legal and social perceptions of land ownership within a framework where minerals are vested in the State.[23] This

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20 Environmental and anti-CSG and fracking groups have been established worldwide. The United States environmental documentary, 'Gaslands' by Josh Fox which aired at the Sundance Film Festival in 2010 and which outlined the experiences of families impacted by coal bed methane mining in Wyoming, Texas, Utah and Colorado has provided significant impetus for the establishment of these groups.

21 Independent Report of Coal Seam Gas Activities in New South Wales, Final Report, 30 September, 2014.
Available at:
http://www.chiefscientist.nsw.gov.au/__data/assets/pdf_file/0005/56912/140930-CSG-Final-Report.pdf.

22 See for example, S. Johnston, ''Whose right – The Adequacy of the Law Governing CSG Development in Queensland' (2001) *Australian Mining and Petroleum Law Journal* 259 where the author notes the expansion of regulatory conflicts that have emerged due to the granting of overlapping exploration and production titles.

23 For a full discussion of the dominial, public mineral ownership regime in Australia see James K. Boyce, 'From Natural Resources to Natural Assets', in *Natural Assets: Democratizing Environmental Ownership* (James K. Boyce and Barry G. Shelley eds) 2003

has generated significant disharmony between landholders and mining proponents.[24] It has also highlighted the need for a more comprehensive delineation of the 'access' interface between land and mineral ownership.[25]

The public ownership framework is not properly supported in Victoria by an environmental assessment process that ensures all issued titles are rigorously reviewed. Improved environmental assessment is particularly imperative for unconventional gas projects given the multivariate environmental impacts connected with the novel technology developments for extraction. The capacity of these advancements, to deplete, contaminate, or otherwise impact upon ground water aquifers and sub-surface seismicity is not entirely understood but continues to be a source of global concern.[26]

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24 See in particular the discussion by J.R. Nash and S.M Stern, 'Property Frames' (2010) 87 *Washington University Law Review* 449 which argues that the excessive perceptions of ownership rights imposes social costs, frustrates policy goals and clashes with the needs of modern society.

25 See H.E. Smith, 'Self-Help and the Nature of Property' (2005) 1 *Journal of Law, Economics and Policy* 69 at 73 where the author suggests that there should be a cost benefit analysis undertaken wherever completing claims to the same natural resource arise.

26 The environmental concerns connected with unconventional gas extraction are extensive. They have been well summarized by J.R. Ray, 'Shale Gas: Evolving Global Issues for the Environment, Regulation and Energy Security' (2013) 2 *LSU Journal of Energy Law and* Resources 75. The author concludes at 82 that one of the most significant concerns associated with hydraulic fracturing lies in water pollution which can occur through: (i) frack fluid contamination through natural or induced fractures; (ii) groundwater contamination after flowback and (iii) well casing failure that directly contaminates the aquifer.

Unconventional gas extraction must be supported by a rigorous regulatory framework that supports clearly articulated access and compensation entitlements and an environmental assessment process that is independent, transparent and, to the greatest extent possible, meticulous and subject to risk mitigation assessment processes that are consistent with the principles of ecologically sustainable development.[27]

5. Towards a New Regulatory Framework

The regulatory framework underpinning unconventional gas development[28] in Victoria, as in the rest of Australia, is sourced in the underlying public ownership regime for minerals.[29] Ownership of onshore minerals and petroleum is vested in the state pursuant to specific statutory vesting provisions. In Victoria, section 9 of the *Mineral Resources Sustainable Development Act* 1990 (MRSD) makes it clear that ownership of all minerals, which are specifically defined in the MRSD to include coal seam gas, vest in the Crown. Section 13 of the *Petroleum Act* 1998 (Vic) sets out that all petroleum that came to be on or below the surface without human assistance is owned by the Crown. The definition of petroleum in the PA is broad enough to include shale and

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27 It is argued by M. Walton, 'Queensland Shale Gas: A Rocky Road for the New Kid on the Block' (2014) 42 *Australian Business Law Review* 16, that one of the key factors holding back the expansion of shale gas in the eastern states of Australia are the social licencing issues connected with unconventional gas development.

Natural gas may be derived from both conventional and unconventional reservoirs. Conventional gas refers to those gases that are 'trapped in structures in the rock that are caused by folding and/or faulting of sedimentary layers' and can be relatively easily be extracted from these 'traps'. Unconventional gas, whilst still classed as natural gas, is less easily extracted and can be found trapped in impermeable rock, which cannot 'migrate to a trap and form a conventional gas deposit.' Unconventional gas can encompasses coal seam gas, shale gas and tight gas reserves. See further discussion on the difference by Australian Council of Learned Academies (ACOLA), *Engineering Energy: Unconventional Gas Production – a Study of Shale Gas in Australia* (May 2013).

29 For a full discussion of the nature of public mineral ownership see generally:

James K. Boyce, 'From Natural Resources to Natural Assets', in *Natural Assets: Democratizing Environmental Ownership* (James K. Boyce and Barry G. Shelley eds) 2003.

tight gas, which would be excluded from the specific definition of minerals in the MRSD.[30]

Public ownership frameworks for minerals and petroleum are operative in many countries around the world. The rationale for the state ownership of minerals and petroleum is sourced in the assumption that community welfare is best served where the responsibility for managing valuable resources lies with the government.[31] Public ownership frameworks distinguish natural resources from land tenure; natural resources are vested in the government whilst landowners are left with a right to compensation for any potential taking from the surface lands.[32] The public ownership framework allows states to licence out concession rights to mining proponents to explore, extract and produce unconventional gas in accordance with the terms of the specific mining tenement. The granting of exploration and production permits to eligible applicants is regulated via a statutory framework and all eligible applicants must comply with defined statutory criteria.[33]

The public ownership framework does not, in itself, provide a sufficient foundation for the articulation of private landowner entitlements in the context of mineral and

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30 *Petroleum Act* 1998, s6. Compare this to the definition of minerals in the *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s4 which only includes hydrocarbons contained in coal.

31 See the discussion by Patrick Wieland, 'Going Beyond Panaceas: Escaping Mining Conflicts in Resource-Rich Countries through Middle-Ground Policies' (2013) 20(2) *New York University Environmental Law Journal* 199 esp at 209 where the author notes that this welfare objective has not been met because of the overriding economic imperatives.

32 See the discussion by Y. Omorogbe and P. Oniemola, 'Property Rights in Oil and Gas Under Dominial Regimes' in *Property and the Law in Energy and Natural Resources* 2010 (ed) A. McHarg, B. Barton; A. Bradbrook and L. Godden, at 115.

33 For a discussion of the operational mechanics of the concession system see: James. K. Boyce, 'From Natural Resources to Natural Assets', *Natural Assets: Democratizing Environmental Ownership* above n. 6 at 7. For a detailed discussion on the articulation of the concession framework as a component of globalization see Franklin A. Gevurtz, 'Globalization of Corporate Law: The End of History or a Never-Ending Story' (2011) 86 (3) *Washington Law Review* 475 where the authors argue that the implementation of global concession frameworks has been a contributing factor in the shift towards corporate global convergence.

petroleum development and must be complemented by detailed regulatory provisions that promote comprehensive and protective access and compensation entitlements.[34] In Victoria this requires the introduction of new provisions, or statutory codes, akin to those that have been introduced in both Queensland and New South Wales, delineating the nature and scope of access rights and the manner and form of their exercise.[35] Improved statutory access and compensation provisions ensure landowners are properly prepared for any impact of connected with onshore petroleum development. This inclusive regulatory approach avoids the language of veto and refusal and seeks to promote a cooperative framework allowing landowners to plan for impacts connected with onshore gas development

A significant problem exists in the fact that the public ownership framework is not properly supported in Victoria by an environmental assessment process that ensures all issued titles are rigorously reviewed. Improved environmental assessment is particularly imperative for unconventional gas projects given the multivariate environmental impacts connected with the novel technology developments for extraction. The capacity of hydraulic fracturing and horizontal drilling to deplete, contaminate, or otherwise impact upon ground water aquifers and sub-

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34 The interface between mining titles and farming interests in Queensland was discussed by M. Walton, "The Queensland CSG Industry: Miners Versus Farmers – Do the 2010 Water Act Amendments for Underground Water Management Ease the Tension?" (2013) 32 *Australian Resources and Energy Law Journal* 19.

35 A Land Access code was introduced in Queensland, pursuant to s24A of the *Petroleum and Gas (Production and Safety) Act* 2004: see http://mines.industry.qld.gov.au/assets/land-tenurepdf/land_access_code_nov2010.pdf In New South Wales, a land access code has been recommended pursuant to s69DB of the *Petroleum (Onshore) Act* 1991 (NSW). See http://www.haveyoursay.nsw.gov.au/assets/premier-and-cabinet/cal-gray/Code-of-Practice-for-Land-Access-1.pdf

surface seismicity is not entirely understood but continues to be a source of global concern.[36]

The recommendations outlined in the 2013 Victorian gas taskforce report address some of these concerns, with reforms suggestions that include the appointment of a gas commissioner, the creation of an independent scientific water committee and an increase in the compensation threshold for loss of amenity for landowners.[37]

Whilst the recommendations outlined in the report are positive, they do not go far enough.[38] The expansion of the unconventional gas industry in Victoria requires clear, focused, responsive mineral and petroleum laws to ensure that this valuable resource is both strategically and responsibly developed. The following regulatory reforms are recommended:

- **The implementation of a single, uniform legislative framework for unconventional gas rather (integrating MRSD and the Petroleum legislation)**
- **The implementation of explicit unconventional gas provisions dealing with community engagement, compensation, environmental assessment,**

36 The environmental concerns connected with unconventional gas extraction are extensive. They have been well summarized by J.R. Ray, 'Shale Gas: Evolving Global Issues for the Environment, Regulation and Energy Security' (2013) 2 *LSU Journal of Energy Law and* Resources 75. The author concludes at 82 that one of the most significant concerns associated with hydraulic fracturing lies in water pollution which can occur through: (i) frack fluid contamination through natural or induced fractures; (ii) groundwater contamination after flowback and (iii) well casing failure that directly contaminates the aquifer.

37 Victorian Gas Market Taskforce Final Report and Recommendations, Released October 2013, Victorian State Government. Chaired by the Honourable Peter Reith.

38 Ibid. Recommendation 3 of the Taskforce Report suggests that the Victorian government take immediate action to engage landholders and communities by appointing a Gas Commissioner, whose primary objectives will be consulting with and building landholder and community confidence in the processes around unconventional gas exploration and the potential for development in Victoria.

chemical bans, water assessment and hydraulic fracturing regulation

- **The implementation of a detailed land access code with mandatory and aspirational best practice requirements;**
- **The implementation of mandated conduct and compensation agreements between landholders and resource proponents with the scope and range of compensation legislatively broadened;**
- **The implementation of mandatory environmental impact assessment for all CSG, shale and tight gas projects that take account of principles of ecologically sustainable development;**
- **A recommended expansion of the national EPBC Act to cover both CSG and shale impacts on water resources.**

1.Who owns the minerals – the concerns

The fundamental common law land ownership principle, *cuius est solum, eius est usque ad coelum et ad inferos,* is that whoever owns the soil, it is theirs all the way up to heaven and all the way down to hell.[39] This Latin maxim has not been literally applied, and is subject to extensive statutory modification in every Australian state.[40] The ownership of minerals and petroleum are statutorily vested in the state in right of the Crown.[41] The public ownership framework

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39 For an Australian perspective see P. Butt, *Land Law* 6th ed, 2010 at para 2.05-2.07 where it is noted that the maxim dates back to at least 1285 in English law, but may in fact have its origins 1000 years earlier in Jewish law. See also the detailed discussion of the ad coelum principle see John. G. Sprankling, 'Owning the Center of the Earth' (2008) 55 UCLA Law Review 979, 988-982 (2008) where the author proposes a defined 'outer limit' for sub-surface ownership.

40 See P. Butt, 'How far down do you Own? The Final Word' (2010) 84 *Australian Law Journal* 746.

41 In Victoria, the ownership of minerals is governed by the Mineral Resources (Sustainable Development) Act 1990, s9 (where minerals is defined in s4 to include hydro-carbons from oil, shale or coal). Importantly, shale and tight gas come within the application of the Petroleum Act 1998 (Vic) , s6(2), which has a similar application. See

means that surface estate owners do not have a right of veto against mineral and petroleum title holders because they do not own the underlying minerals and petroleum that the titleholders have been given permission to extract.[42]

The theory and primary objective underpinning the public ownership framework is that state control over minerals exploitation provides greater transparency in the allocation of licences and the royalties that are generated through the issuance of such titles can subsequently be relocated for public purposes.[43] In practical terms however, this welfare rationale is considerably flawed and experience, particularly in third world countries, has shown that the expansion of the mining industry does not necessarily guarantee an effective distribution of mineral rents. [44]

One of the major issues with the public ownership framework, which is clearly illustrated through the rapid global expansion of unconventional gas development, is the potential for conflict between mineral and petroleum titleholders and surface estate ownership.[45] This has been felt particularly acutely in New South Wales where conflict over the expansion of coal seam gas mining in the Hunter

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also the Petroleum Onshore Act (NSW) s6 ; and the Petroleum and Gas (Production and Safety) Act 2004 (Qld) s26, which also vest the ownership of minerals in the state.

42 This is carefully explained by Sharon Christenson, Pamela O'Connor, W.D. Duncan and Angela Phillips, 'Regulation of Land Access for Resource Development: A Coal Seam Gas Case Study from Queensland' (2012) 21 *Australian Property Law Journal* 110.

43 This is discussed by Richard Auty, 'Mining Enclave to Economic Catalyst: Large Mineral Projects in Developing Countries' (2007) 13 *Brown Journal of World Affairs* 135 esp at 136 where the author notes that the domestic economic impact of mining is narrowly channelled

44 See Wieland, above n 5 at 210. Wieland argues that the monetary advantages for governments in the public ownership framework can lead to corruption and exploitation.

45 For example, the independent Land Access Review Panel in Queensland concluded that 'the potential for conflict between exploration and agricultural activities tends to rise with the intensity of land use and the magnitude of the potential impact. In sparsely stocked grazing areas land holder concerns about exploration activity on their land are not as great as in areas where land is intensively cropped and irrigated.' See Land Access Framework – 12 month review – Report of the Land Access Review Panel, Watson D, Dickie G, Cotter J, Clark A, Sansom G, February 2012, at 15.

Valley has been particularly divisive.[46] From a common law perspective, minerals and petroleum that reside in the sub-surface strata are treated as a natural constituent of the strata because of the difficulties associated with creating horizontal divisions in the substratum.[47] The public ownership framework alters this perspective because minerals are owned separately by the Crown and therefore acquire an independent legal identity despite their physical integration.

This statutory disaggregation creates difficulties where the boundary entitlements are not clearly defined because the inextricable nature of the sub-surface strata and the minerals and petroleum that reside in that strata make it impossible to explore or extract without impacting upon the rights of the surface estate owner.[48] In this respect, where statutory vesting provisions are not supported by detailed interface provisions, outlining the nature and scope of the rights of mining and petroleum title holders to physically access land belonging to private owners, for the purpose of conducting state authorised exploration or extraction, the likelihood of conflict is enhanced.[49] Often this is evidenced through the assumption by private landholders that there right to use and enjoy precludes a right on the part of

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46 See in particular the discussion by See T. Boisel, Coal Seam Gas Exploration and Production in New South Wales: The Case for Better Strategic Planning and More Strategic Regulation' (2012) 29 *Environmental Planning Law Journal* 129.

47 See the conclusions of Windeyer J in *Bursill Enterprises_Pty._Ltd._v._Berger Bros._Trading_Co._Pty._Ltd* [1971] 124 CLR 73 at 91: 'at common law he [the freeholder] could dispose of a part of his holding by horizontal subdivision, just as by vertical subdivision…There were objections to this in medieval times..But.by.Coke's.time.these.had.disappeared. He.said: "A man may have an inheritance in an upper chamber though the lower buildings and soil be in another, and seeing it is an inheritance corporeal it shall pass by livery ."

48 See the discussion by Edella. Schlager and Elinor. Ostrom, 'Property-Rights Regimes and Natural Resources: A Conceptual Analysis' (1992) 68(3) *Land Economics* 249, 260 where the authors outline the difficulties that statutory intervention and other 'exogenous and endogenous' factors have had upon orthodox common law land ownership.

49 See, O'Connor, Duncan and Phillips, 'Regulation of Land Access for Resource Development: A Coal Seam Gas Case Study from Queensland' above n.22 at 115.

resource title holders to access the resource that is statutorily vested in the state.

The deviation of public mineral ownership from core common law principles regarding the owner of sub-surface land generates inevitable resource conflict. These are avoided in the United States because private landowners retain ownership over sub-surface minerals and petroleum, as their title is allodial, and they have the right to bifurcate those minerals and petroleum pursuant to the doctrine of severance and create a separate mineral estate. This necessarily means that the landowner is directly involved in any resource exploration or extraction that is carried out on their land.[50]

The statutory provisions that vest ownership of minerals and petroleum in the state lack clearly articulated domain entitlements.[51] This is problematic because these vesting provisions form the foundation for the issuance of resource titles. Hence, if the nature of the public ownership is not properly articulated, the rights and entitlements of mining and petroleum proponents lack a clear foundation. This fact, combined with the increased opportunity for conflict and division that has resulted from the expansion of unconventional gas into agricultural and other land use sectors, has accelerated the need for a more enhanced statutory expression of the ownership framework.[52]

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50 For a detailed discussion of the doctrine of severance in the United States see Troy A. Rule, 'Property Rights and Modern Energy' (2012-2013) 20 *Geo. Mason L. Rev.* 803 esp at 836.

51 The vesting provisions in Victoria, Queensland and New South Wales are minimal, simply outlining that ownership of the mineral or petroleum resides with the Crown or state. See: *Petroleum and Gas (Production and Safety) Act* 2004 (Qld), s26; *Mineral Resources Act* 1989 (Qld), s8; *Petroleum (Onshore) Act* 1991 (NSW), s6; *Mineral Resources (Sustainable Development) Act* 1990, s9; Petroleum Act 1998 (Vic), s13.

52 See in particular the discussion by T. Hunter and P. Weir, 'Property Rights and Coal Seam Gas Extraction: The Modern Property Conundrum' (2012) 2 (2) *Property Law Review* 71. For a discussion of this issue in the United States see C. Carlane, 'Exploring Methodological Changes within

One of the most controversial issues associated with unconventional gas development within a public ownership framework, from the perspective of the surface estate holder, is the entitlement of mineral and petroleum title holders to access private land for the purpose of conducting licence activities. Access entitlements are ancillary to mining and petroleum activities as they represent an intrinsic component of both exploration and production licence entitlements.[53]

The *Mineral Resources (Sustainable Development) Act* 1990 (Vic) (MRSDA) requires all licence activities, including access rights, to be approved as a component of a mandated work plan.[54] This entitlement is somewhat qualified by s43(1)(e) which requires the holder of an exploration or a retention licence to carry out work on land covered under the licence only with the express written consent of the landholder. Such consent may, however, be presumed where a registered compensation agreement exists pursuant to s43(1)(e)(ii) or, where the Victorian Civil and Administrative Tribunal (VCAT) has made a compensation determination pursuant to s43(1)(e)(iii).

Where it is determined that the work amounts to 'low impact exploration work', informed verbal consent from the private landowners will suffice.[55] Additionally, if the licence

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the Context of Climate Change Law and Policy' (2011) 105 *American Society of International Law Proceedings* 255 at 256.

53 Access entiitlements for mining licences are implied under s14(1)(c) of the *Mineral Resources (Sustainable Development) Act* 1990 (Vic). A similar provision does not exist for exploration licences however s13(1) entitles the holder to carry out 'exploration' on the land covered within the licence and access to the land is an implied right. Similar provisions exist in the *Petroleum Act* 1998 although s18(b) confers upon an exploration title holder the right to do anything necessary or incidental to petroleum exploration. Section 46(c) confers similar rights upon production licences for petroleum. For an excellent discussion on the importance of access for mining tenements within a public ownership framework see P.J. Badenhorst,' 'Towards a theory on publically-owned minerals in Victoria' (2014) 22 Australian Property Law Journal 157.

54 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 40.

55 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 43(1)(ea).

application relates to land within 100 metres of a dwelling place, or to land where an ongoing protection declaration exists under the *Aboriginal Heritage Act* 2006, or to land which has been declared an archaeological site under the *Heritage Act* 1995, written consent from the land owner or the executive director of the *Heritage Act* 1995 is required.[56]

Similar provisions exist for holders of mining or prospecting licences under the MRSD. The relevant government department will grant a work authority where it can be shown that the licence holder has obtained the written consent of the landowner or the licensee and the landowners have made a registered compensation agreement, or an amount of compensation has been determined by VCAT respectively.[57]

Sections 38AA and 38AB of the MRSDA further stipulate that the holder of a mining licence, prospecting licence or retention licence is required to survey and mark out the boundaries of the land under the licence. Consent to enter the land is required from the land owner or occupier for this to occur however, the minister may grant authority to a licensee to enter land, for the purpose of surveying or marking out of boundaries, where no consent has been obtained, provided it can be shown that the licensee made reasonable attempts to obtain consent.[58]

The *Petroleum Act* 1998 (Vic)(PA) operates pursuant to a slightly different licensing framework stemming from the fact that it was originally devised for offshore licencing.[59] The provisions of the PA expressly confer rights upon each different type of petroleum licence. Hence, the holder of a

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56 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 45.

57 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), ss42(2)(c)(i), (ii), (iii).

58 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s38AB(1) (b).

59 For an interesting discussion on the extraction processes relevant to petroleum resources see M. Neave,'The Conservation of Oil and Gas' (1969) 7 *Melbourne University Law Review* 201.

petroleum exploration, retention and production licence is entitled, in addition to the primary licence activity, to do 'anything in that area that is necessary for, or incidental to, that purpose.'[60] This ancillary provision functions as an umbrella provision, upholding all entitlements, including access entitlements, where they must be exercised for the purpose of petroleum exploration, retention or production.

Like the MRSD Act, the PA also sets out that a person must not carry out a petroleum activity on private land unless it has first obtained the express consent of the land owner. Where that consent is not obtained, it will be presumed if a compensation agreement has been entered into or VCAT has determined the amount of compensation which is payable.[61] Section 138 of the PA sets out that the Minister must also provide consent for any petroleum activities carried out on land. Presumably this provision refers back to the original offshore focus of the PA, because ministerial authorization is already a component of the issuance requirements for onshore petroleum licences.

One of the core difficulties associated with private land access under both the MRSDA and the PA stems from a lack of clarity and protective scope in the consent provisions that apply to private landholders. The provisions give the impression that private landholders retain a right of veto over mining or production licences and prospecting licences, as they require mining and petroleum titleholders to obtain the written consent of the private landholder prior commencing work pursuant to the title.[62] Where, however, consent is refused, it may be readily authorised through a compensation determination issued in the Victorian Civil

60 *Petroleum Act* 1998 (Vic), s18(b) (exploration licences); s37(b)(retention licences); s46 (production licences).

61 *Petroleum Act* 1998 (Vic), s128.

62 This does not include low impact exploration titles: See *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 42(2)(c)(i)-(iii); *Petroleum Act* 1998 (Vic), s128.

and Administrative Tribunal. Alternatively, in circumstances where the landholder and the mining or petroleum licence holder have entered into and registered a compensation agreement, consent to access the land is presumed and does not need to be expressly sought. Further, the MRSD Act and the PA only require the mining or petroleum titleholder to seek consent. A failure to actually obtain consent does not constitute a breach.[63]

The MRSDA also excludes mining applications from within 100 metres of a dwelling house without the written consent of the owners of the land on which the dwelling house is situated.[64] The difficulty with this consent provision is that once written consent is obtained, it will bind all subsequent owners and occupiers of the land even though they may not be aware of it because of the absence of any document register akin to the petroleum register.[65] The unfairness of this 'enduring' consent was noted by VCAT in *Tech-Sol Resources Pty Ltd v Minister for Energy, Industries and Resources* where the tribunal considered two decisions by the Minister to service notice for non-compliance with s45 of the MRSDA.[66] During the course of the judgement, VCAT noted that there was no mechanism whereby parties could be put on notice of the existence of a consent because of the absence of any registration obligations. Subsequently a Ministerial inquiry was set up to review the effectiveness of ss45 and 46 of the MRSDA.[67] The inquiry recommended that consents issued pursuant to s45 should be in writing *and*

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63 See *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 42(2)(c)(i)-(iii); *Petroleum Act* 1998 (Vic), s128.

64 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s45(2). There is no equivalent provision in the *Petroleum Act* 1998 (Vic) although s12 confers broad-ranging powers on the Minister to exempt land for significant environmental reasons, for significant commercial or economic activity or for any other reason the Minister considers to be appropriate.

65 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), 45(3)(c). A petroleum register is set up under the Petroleum Act 1998 (Vic), Part 14, Division 1.

66 [2004] VCAT 1648

67 *Mineral Resources Development Act* 1990: *Inquiry into ss45 and 46 Report and Recommendations 2005,* 1.

registered to ensure that they are available for inspection by the public.[68] This has now been adopted by the MRSDA.[69]

The regulatory schema for consent under both the MRSDA and the PA is problematic, particularly with the advent of unconventional gas expansion, because it disengages the surface estate owner from the activities associated with a mining project that is occurring upon their land.[70] Landowners retain no substantive right to refuse consent because any such refusal may be overridden. Further, under the MRSDA any prior consent given which authorises mining within 100 metres of a dwelling residence has an application to all future mining applications over the same land. The effect of this is that the consent is tied to the approved work plan and is capable of applying to any future licensee until the completion of the mining operation.[71] The MRSDA does not deal with a refusal of a private landholder to give consent to a mining operation within 100 metres of a dwelling residence although presumably where such consent is denied, the Minister pursuant to s46 of the MRSDA may approve it.[72]

The consent process is bewildering for landholders as it fails to clearly delineate the statutory ownership entitlements that support a mineral and petroleum title and how those rights interact with surface estate ownership.[73]

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68 Ibid at 88.

69 See *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s69((2)(a)(iiia).

70 See in particular the discussion paper by the Victorian Environmental Defenders Office, 'Reforming Mining Law in Victoria' above n 1, 44. For a broader discussion on the importance of community involvement in the issuance of resource titles see: J. P. Williams, 'Global Trends and Tribulations in Mining Regulation' (2012) 30 *Journal of Energy and Natural Resources Law* 391 esp at 398-399.

71 See E.M. Poletti, 'The Interface of Sensitive Private Land Issues and Mining: Victorian Reforms Seeking Resolution' (2007) 26 *Australian Resources and Energy Law Journal* 202 at 205.

72 Section 46 of the *Mineral Resources (Sustainable Development) Act* 1990 (Vic) authorizes the Minister to approve work within 100 metres of a dwelling residence after consulting the municipal council and community groups.

73 See the discussion by Poletti above n.51 at 207-208.

The utilisation of broad authorisation provisions within a regulatory scheme has been described as a 'quintessential state power' and the utility of such provisions is well established.[74] Authorisation provisions are generally used to establish an environment of trust and to address informational asymmetries.[75] The difficulty, however, in adopting such provisions for private landholders is that the right to authorize is not supported by the underlying ownership framework. The consent provisions confuse the ownership division by creating an expectation that access for the purpose of mineral or petroleum work depends upon private landholder consent and when a refusal is overridden it can generate antagonism and discontent.

A further concern is the absence of any protective statutory regulation outlining the manner and form in which consent may be exercised. An important issue for landholders affected by unconventional gas projects is the issue of how mineral and petroleum titleholders should exercise access rights and what provisions exist to protect the interest of landholders and minimize disruption to surface estate activities. These concerns factor highly in community engagement processes.[76] Both the MRSDA and the PA lack focused best practice provisions to regulate the exercise of access entitlements by mining or petroleum titleholders against private landholders. The only provision providing any real protection is the requirement that a compensation agreement, if entered into between a landholder and a

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74 A. Frieberg, *The Tools of Regulation*, Federation Press 2010 at 141. See also R. Balwin and M. Cave, *Understanding Regulations: Theory, Strategy and Practice,* 1999 at 34.

75 See C. Sunstein, 'Informational Regulation and Informational Standing: *Akins* and Beyond' (1999) 147 *University of Pennsylvania Law Review* 613.

76 This is expressly articulated in the Victorian Government, Government Response – *Economic Development and Infrastructure Committee - Inquiry into greenfields mineral exploration and project development in Victoria*, May 2013, at 3 where the report indicates that building community confidence in unconventional gas development through greater engagement is a high priority. See http://www.parliament.vic.gov.au/edic/article/1391

mineral or petroleum titleholder, may include a description of the licensee's proposed work including location and area of the work.[77] However, unlike other states such as Queensland, entering into a compensation agreement is not mandatory.[78]

In light of the increasing importance connected with the exercise of access rights, this absence constitutes a significant oversight. It is crucial that landholders be fully appraised of the nature, manner and scope of the access rights connected with unconventional gas licences and that all relevant land information that is not already set out on the mineral or petroleum register be properly exchanged.[79]

Reform of both the MRSDA and the PA to include provisions that further involve the private landholder in a mutual determination of when, how and where access by mining and petroleum title holders is be exercised as well as disclosure provisions supporting the reciprocal release of land information not already available on the mineral or petroleum registers.[80] This reform is particularly imperative in the context of unconventional gas development, given the myriad of concerns underlying new extraction technologies and the heightened need for community engagement.[81]

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77 *Mineral Resources (Sustainable Development) Act* 1990, s87(3).

78 In Queensland, landholders are required to enter into a conduct and compensation agreement with a mineral or petroleum title holder. See Petroleum and Gas Act (Production and Safety) Act 2004s 153, Minerals Resources Act 1989s 140A

79 See generally the discussion by Sharon Christenson, Pamela O'Connor, W.D. Duncan and Angela Phillips, 'Regulation of Land Access for Resource Development: A Coal Seam Gas Case Study from Queensland' above n. 22 at 116 where the authors, in discussing the nature of land access agreements in Queensland, refer to the increasing importance of access rights given the expansion of unconventional gas projects. See also See also R Lyster, 'Coal Seam Gas in the Context of Global Energy and Climate Change Scenarios' (2012) 29(2) Environmental Planning Law Journal 91 for a discussion of the implications regarding the expansion of unconventional gas in Australia.

80 Disclosure laws have been described as more democratic and empowering than command and control regulation because of its protective capacity. See J.A. Weiss, 'Public Information' in L.M. Salamon, (ed), *The Tools of Government: A Guide to the New Governance* 2002, 242.

81 For a general analysis of landholder concerns regarding access in the context of

(ii) Reform Options: Access Agreements, Land Access Code and Gasfields Commission

A non-binding code of practice for mineral exploration under the MRSDA was introduced in Victoria in 2008, setting out recommended standards, procedures and some practical guidance for the unconventional gas industries.[82] There are some, but not many, provisions that deal with land access and consent issues.[83] For example under Part 1, a licensee is obliged to keep an up to date register that includes 'all relevant consents.'[84] Under Part 3, the code recommends that vegetation only be removed after written consent is obtained from the private landowner.[85] Under Parts 8 and 9, the need for authorities to obtain consent to enter the 100 m buffer zone for aboriginal places listed on the Aboriginal Heritage Register and for areas of non-indigenous cultural heritage significance under the Heritage Act 1995 is confirmed.[86] Part 18 sets out that tracks and roads may only be constructed where an approved work plan is issued with the consent of the landowner.[87] Part 22 also sets out that land rehabilitation should be covered within consent/compensation agreements.[88]

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unconventional gas development see: J. Bodenmann, M. Cameron, K. O'Hare and E.R. Solomon, 'Research Note: A Comparative Study into the Rights of Landholders to Prevent Access to Land by Mining Companies' Queensland Council for Civil Liberties, University of Queensland, 2010 esp at 12 where the authors note the community importance attributed to access negotiation provisions.

82 This was introduced pursuant to s89A of the *Mineral Resources (Sustainable Development) Act* 1990 (Vic).

83 Victorian Government, 'Code of Practice for Mineral Exploration, Standards, procedures and practical guidance under *the Mineral Resources (Sustainable Development) Act* 1990' (Vic), Department Of Primary Industries See: http://www.energyandresources.vic.gov.au/__data/assets/pdf_file/0010/21151/CoP_Min_Expl_2008.pdf
Note that the Code of Practice has no application to the *Petroleum Act* 1998 (Vic), and therefore does not apply to shale or tight gas.

84 Ibid 5.

85 Ibid 7.

86 Ibid 12, 13.

87 Ibid 19.

88 Ibid 23.

The existing code, does not however, provide any detailed guidelines prescribing the manner in which mining proponents should exercise their access entitlements. The introduction of coordinated land access regulations, that include mandatory conduct and compensation agreements, regulated by a detailed land access code, as has occurred in Queensland and as is proposed in New South Wales, provides the most effective and comprehensive solution to these concerns.[89]

Such reforms would need to apply to all forms of unconventional gas and therefore have an application to both the MRSDA and the PA. The object is to improve the way in which mining and petroleum holders exercise land access entitlements via the introduction of mandated agreements which ensure landholders are properly involved in both access and compensation negotiations, and that conduct arrangements are overseen by best practice obligations.[90]

(iii) Queensland Conduct and Compensation Agreements and Land Access Code

The Queensland land access policy framework was established by the Land Access Working Group. Its core elements are: a requirement for all resource authority holders to comply with a single Land Access Code; entry notice requirements for lower impact activities; and a requirement to negotiate a Conduct and Compensation agreement prior to accessing private land. The policy

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89 The Review of Heads Compensation for Land Access In Queensland, released 30th August, 2013, Department of Natural Resources and Mines, which reviewed the current compensation regime in Queensland, makes it clear that this framework is efficient and effective. See: http://mines.industry.qld.gov.au/assets/native-title-pdf/appendix-2-skm-report.pdf

90 In this respect, the Code would not alter any of the fundamental ownership assumptions that underlie the public ownership framework.

framework is given force through legislation, including compliance and enforcement provisions for breaches of the Land Access Code.[91]

All mineral and petroleum titleholders in Queensland have a legal obligation to negotiate what is known as a conduct and compensation agreement (CCA) with a private landholder. Both parties are required to use 'reasonable endeavours' to negotiate a conduct and compensation agreement.[92] The Queensland Land Access Code then provides a set of principles to guide the behavior of mineral and petroleum titleholders involved in such negotiations. The Queensland Land Access Code applies to all of the resource legislation in that state, including the *Geothermal Energy Act* 2010 (Qld), the *Geothermal Exploration Act* 2009 (Qld), the *Greenhouse Gas Storage Act* 2009 (Qld), the *Mineral Resources Act* 1989 (Qld), the *Petroleum Act* 1923 (Qld) and the *Petroleum and Gas (Production and Safety) Act* 2004 (Qld).

The implementation of mandatory conduct and compensation agreements in Queensland has helped straighten out some of the difficulties associated with landholder engagement from the outset. Where all parties are legally required to enter into an agreement, the possibility of a landholder refusing consent is removed, making the process more straightforward. In such a context, the emphasis lies upon rigorous and comprehensive negotiations processes. The time and effort associated with CCA negotiation will depend upon a range of factors including: the nature of the existing land use. For example, a landholder conducting an intensive agricultural business would be expected to spent more time and effort negotiating

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91 See Victorian Gas Market Taskforce Supplementary Report at 49. See: http://www.energyandresources.vic.gov.au/about-us/publications/Gas-Market-Taskforce-report

92 *Petroleum and Gas Act (Production and Safety) Act* 2004; s153, *Minerals Resources Act* 1989, s140A

the terms of a CCA.[93] Other factors include: the nature of the advanced activity (high or low impact); nature of landholders business, level of experience of landholder as well as the type of negotiation tactics used by resource firms.

The breadth of the costs deemed reasonable and therefore capable of being covered by a conduct and compensation agreement have been directly aligned with Queensland Land Court rulings which have allowed landholder's to recover costs for their time in some instances. Queensland is the only jurisdiction where compensation for reasonable and necessary legal, valuation and accounting costs and diminution of value of land is identified in a formal legal head of compensation. In *Lowrey v Co-ordinator General*, the court determined 'that an owner cannot be compensated for time in correspondence or doing background research. Although, it may be necessary and reasonable for an owner to be present while a valuer undertook an inspection.'[94] Previously, in *Sullivan v Oil Company of Australia Ltd* the Queensland Land Court ruled that 'the cost recoverable for owners time in claims under the MRA (Mineral Resources Act 1989 (Qld)) are quantified by specific reference to the activities that the landholder must undertake in light of mining activity on his or her property e.g. travelling to the vicinity of the mining activity on a time period relevant in light of the nature of mining activity so that the landholder can check that gates are being left open or shut as appropriate, fencing is in order and there are no dangerous substances assessable to cattle or the like.'[95]

Mandatory conduct and compensation agreements are reinforced by a detailed land access code which has also proven to be particularly effective in ensuring that the

93 This is discussed extensively in The Review of Heads Compensation for Land Access In Queensland, above n. 70 at 20.

94 [2012] QLC 0026

95 [2001] QCA 252

relationship between mining proponents and private landholders is respectful and productive and in improving efficient information exchanges.[96] The express object of the Queensland code has been to apply the state's best practice guidelines for communication between the holders of authorities and owners and occupiers of private land; and to impose on the authorities mandatory conditions concerning the conduct of authorised activities on private land. [97]

The structure of the Queensland code is straightforward. Part 2 of the code outlines best practice guidelines and Part 3 imposes mandatory conditions outlining the conduct of authorized activities on private land.

The Part 2 guidelines of the Queensland code are prescriptive and aim to establish good relations between the parties. Any person who enters property owned or managed by another party to undertake authorised activities on behalf of a holder should demonstrate common sense and courtesy, consult regularly, and comply with statutory and contractual obligations. One of the core requirements in Part 2 relates to the need to facilitate effective communication between the mining proponent and the landholder. In this respect, the Queensland code outlines the importance of the mining proponent making early contact with the landholder to arrange a visit to inspect the property well in advance of any planned, authorized activities.

Communication regarding the intentions of mining proponents with respect to authorized activities and

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96 Department of Employment, Economic Development and Innovation, Land Access Code, November 2010. See: http://mines.industry.qld.gov.au/assets/land-tenure-pdf/land_access_code_nov2010.pdf

97 Ibid 3. The code defines its object as establishing: the 'states best practice guidelines for communication between the holders of authorities and owners and occupiers of private land; and imposes on the authorities mandatory conditions concerning the conduct of authorised activities on private land.'

changes to operations or timing is strongly encouraged. Similarly, under the code, the landholder is encouraged to provide responses to requests or notices with minimum delay, to engage with the mining proponent regarding property values and operational considerations, to respect the entitlements of mining proponents, to provide reasonable access and to engage with the mining proponent to determine appropriate conduct and compensation agreements. The code outlines the landowners obligations with respect to providing the mining proponent with comprehensive information regarding their property including: the location of special features of the property, advice on the preferred access routes, suitable campsite locations, water supply and location, the timing and nature of significant farm programs and any property information relevant to the resource activities such as tracks, fences, gates, bores, dams and bio-security issues.

The Part 3 requirements of the Queensland code are mandatory and impose a specific range of behavioural requirements upon mining proponents and landholders regarding the exercise of access rights. Mandatory requirements imposed by the code relate to those activities most likely to disturb surface estate owners and include: notice of the proposed mining activities to be given to the landholder in person unless this proves impracticable; existing access points to be utilised unless they prove to be impracticable; where new access tracks need to be established, this process is to be carried out in a manner that minimizes the impact on the landholder's business or land use activities; access rights to be carried out in a manner that minimizes disturbance to people, livestock and property; reasonable steps to be taken to prevent the reproductive material of a declared pest; the location and plan for managing any camp on the land must be agreed upon with the landholder, gates, fences and grids must be restored to their original position or, if damaged, replaced or

repaired as soon as possible. .[98]

A review of the Queensland Government's Land Access Framework was undertaken early in 2012 by an independent panel of agricultural and resource industry experts. The purpose of the review was to assess the framework and its effectiveness and make recommendations on improvements that could be made. The panel documented its analysis of stakeholders' feedback, together with a list of recommendations in a report to government.[99] After seeking the views of the community and stakeholders, the Queensland Government developed what it described as a 'six point action plan' to update conduct and compensation agreements. This included a comprehensive update of access processes including expanding the scope of compensation to include time and effort spent by landholders on entering into conduct and compensation agreements, expanding the jurisdiction of the Land Court to hear matters regarding conduct and compensation agreements, creating a single uniform ADR process for access disputes, and creating a comprehensive plain language resource for landholders and resource companies regarding land information.[100]

(iv) Victorian Reforms: Taskforce and Government Response

The regulatory framework in Victoria is far less developed than Queensland, and the recommendations by the Victorian taskforce report do not go far to redress this. The Victorian Gas Market Taskforce Final Report does not recommend the

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98 See http://mines.industry.qld.gov.au/assets/land-tenurepdf/land_access_code_nov2010.pdf
esp at pp7-9 where mandatory provisions on these issues are outlined.

99 http://mines.industry.qld.gov.au/assets/native-titlepdf/Land_Access_Review_Panel_report.pdf

100 http://mines.industry.qld.gov.au/assets/native-title-pdf/qg-response-land-access-framework.pdf

introduction of mandatory conduct and compensation agreements, nor does it suggest the implementation of a land access code. The only recommendation made by the report is the establishment of a Gas Fields Commission, headed by a gas commissioner, who would resolve conflicts that arise between landholders and mineral and petroleum title holders, akin to the commission established in Queensland to complement the access code.[101] According to the Victorian taskforce report, a Commission would act independently to the industry regulator and it would seek to improve the level of engagement between the government, industry, landholders and communities.

In particular, the taskforce report suggests that one of the aims of the commission would be to facilitate a smoother coexistence between industry, landholders and communities.[102] The taskforce report further suggests that landholders be provided with 'information packs' that outline landholder rights and the availability of mediation to try and facilitate agreement between landholders and project proponents prior to disputes being referred to VCAT.

Whilst the recommendations of the taskforce report are positive, the failure to specifically recommend regulatory reform aimed at improving the way in which access is exercised is concerning. The regulatory developments that have occurred in Queensland cohere with an evolving awareness of the importance of land access regulation to the broader social licensing framework for unconventional gas expansion.[103] Landholders need to be engaged by statutory reforms that reflect their core ownership concerns.[104]

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101 See http://www.gasfieldscommissionqld.org.au/gasfields
The Queensland gasfields commission was set up with the express mandate of manage and improve sustainable coexistence of landholders, regional communities and the onshore gas industry in Queensland.

102 See Victorian Gas Market Taskforce Report, above n11 at 11.

103 This is discussed in The Review of Heads Compensation for Land Access In Queensland, above n. 70 at iv where the report focuses upon the importance of access and

Mandating conduct and compensation agreements and ensuring that those agreements are regulated by detailed best practice standards establishes a benchmark to help foster greater communication and productivity.[105] It also brings predictability and certainty to the relationship by creating a clear and functional operational structure within which each party may operate knowledgeably.[106]

The appointment of a gasfields commissioner is unlikely, in itself, to achieve similar objectives as it seeks to negotiate outcomes for conflicts that have already occurred. Mandated agreements and an access code seek to impose specific standards of behaviour so as to avoid conflict arising from the outset. The gas commission established in Queensland aims to 'strike the right balance to meet the interests of the landholders, local community groups and the environment.'[107] Its capacity to assist in ameliorating the tensions that can flow from land access disputes is, in itself, limited.[108] The commission provides a flexible and responsive means of resolving conflict, but it is only because it operates in conjunction with conduct and compensation agreements and a land access code, that it is equipped to

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compensation for landholder engagement.

104 Queensland Government, *Guide to Queensland's New Land Access Laws* 2010, 4-5. See also M. Hunt, 'Government Policy and Legislation Regarding Mineral and Petroleum Resources' (1988) 62 *Australian Law Journal* 841, 848.

105 See the discussion on the benefits of the Queensland Land Access Code at <http://mines.industry.qld.gov.au/assets/land-tenure pdf/land_access_code_nov2010.pdf>.

106 The utility of codes of behaviour is well documented. See R. J. Waldmann, *Regulating International Business Through Codes of Conduct* 1980 esp at 21-23. See also H.L Pitt and K.A. Groskaufmanis, 'Minimizing Corporate Civil and Criminal Liability: A Second Look at Corporate Codes of Conduct' (1990) 78 *Geo. Law Journal* 1559 where the authors note that codes are very effective at dealing with complex property arrangements by imposing ethical standards of behaviour.

107 Queensland Government, Ministerial Media Statement, 'New commission to restore CSG confidence' (2012) <http://statements.cabinet.qld.gov.au/MMS/StatementDisplaySingle.aspx?id=79011>.

108 See J. Bodenmann, M. Cameron, K. O'Hare and E.R. Solomon, 'Research Note: A Comparative Study into the Rights of Landholders to Prevent Access to Land by Mining Companies' above n.48 at 12.

implement firm, well-recognized behavioural standards that help to prevent access disputes arising in the first place.[109]

6. Compensation Entitlements

i. Existing Regulatory Entitlements

A further significant regulatory conundrum for the existing Victorian framework lies in the limitations that are associated with compensation determinations for private landholders and mining and petroleum titleholders.[110] One of the most striking concerns, particularly in the context of an expanding unconventional gas industry, is the absence of any mandatory provisions for compensation under either the MRSD Act or the PA. Whilst landholders and mining proponents may, at their discretion, privately negotiate a compensation claim between themselves, or a landholder may make a specific claim to VCAT or the Supreme Court, the payment of compensation is not, in itself, a legislative pre-condition for the issuance of an exploration, prospecting or mining licence under the MRSDA or for exploration permits, retention leases or production licences under the PA.

Under the MRSDA, the only requirement regarding compensation is, as discussed above, that work conducted pursuant to an issued exploration, prospecting or mining licence may not commence until either the landholder has given express consent,[111] or the licencee has made a registered compensation agreement, or a VCAT

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109 The capacity to create a code of conduct is specifically anticipated in the *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 89A.

110 *Petroleum Act 1998* (Vic) ss 4 and 8.

111 Note that under an exploration licence, written consent is not required where the work is determined to be low impact exploration work. Informed verbal consent is sufficient. See *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 43(1)(ea).

compensation order has been issued.[112] Similar provisions operate under the PA.[113] This framework does not make it mandatory for the parties to enter into a compensation agreement only that where such an agreement exists, express consent to access land for the purpose of conducting work under the mineral or petroleum title is presumed.

This framework may be directly contrasted to that which exists in Queensland, where the parties are required to enter into a conduct and compensation agreement (CCA) prior to any entry onto private land for the purpose of conducting an advanced activity.[114] In this respect, the CCA is a firm pre-requisite and provides a starting point for more robust compensation and defendable compensation methodologies capable of taking into account actors such as property valuation, improved value, disturbance, and current land use) were well documented, underpinned by a good body of evidence, repeatable and capable of being tailored to specific landholder circumstances.[115]

Under the MRSDA a landholder may enter into a written compensation agreement with a mining proponent regarding the amount or kind of compensation payable but it is not compulsory. Compensation is payable for loss or damage that is a direct, natural and reasonable consequence of the approval of the work plan or the doing of work under the licensee's licence.[116] Where a compensation agreement is entered into, it should be lodged for registration with the mining registrar.[117]

The types of loss that a compensation agreement may cover,

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112 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), ss 43(1)(e)(ii), (iii).

113 *Petroleum Act 1998* (Vic), s 128.

114 *Petroleum and Gas (Production and Safety) Act* 2004 (Qld), s 500.

115 This is discussed in the Review of Heads Compensation for Land Access In Queensland, above n.70 at 5.

116 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 87(1).

117 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 87(2).

where entered into in Victoria, includes: deprivation of possession of the whole or any part of the land, damage to the surface of the land, severance of the land from other land owned by the occupier, loss of amenity including recreation and conservation values, loss of opportunity to make any planned improvement on the land, a decrease in the value of the land and loss of any opportunity to use tailings on the land.[118]

Compensation is payable to both the landholder directly affected by the licence activities as well as adjoining landholders, whose land is impacted indirectly by the impacts from the mining activities.[119] Significantly, no compensation is payable for the value of any mineral in or under the surface of the land and this goes back to the public ownership framework because a landholder cannot be compensated for a mineral or petroleum that they do not own in the first place.[120]

The MRSDA differs slightly from the equivalent Queensland provisions in that there is a specific reference to a 'rehabilitation bond'; to ensure that the land, which is the subject of the mining licence, is restored to the position it was in prior to mining operations commencing.[121] In practical terms the difference is not substantial because the Queensland provisions make allowance for this type of compensation within the conduct and compensation agreement. Further, the MRSDA makes an allowance for a landowner to seek replacement land with a possible 10% increase.[122] This head of compensation does not appear in the Queensland provisions.

118 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 85.
119 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 85(1A).
120 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 85(3).
121 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 80.
122 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 85(2)(b)

Whilst a compensation agreement between a landowner and a licencee is not mandatory under the MRSDA, where it does exist, it is also assumed that a landowner has given consent for work covered under the licence to be undertaken.[123] In this respect, the MRSD Act conflates consent to access the land with agreement regarding the amount of compensation entitlement that is payable.

A compensation claim which is not the subject of a private compensation agreement may be made at any time by a landholder until the expiration of three years after the loss or damage has occurred or the licence expires, whichever is earlier.[124] If a claim for compensation is disputed, the parties are entitled to refer the matter to VCAT for determination or alternatively, to refer the claim to the Supreme Court in accordance with Part 10 of the *Land Acquisition and Compensation Act* 1986 (Vic), provided it is clear that the parties are unable to resolve the matter by conciliation.[125]

Similar provisions exist in the PA. As with the MRSDA, petroleum operations (this includes shale and tight gas mining) under the PA cannot commence on private land until either the landholder has consented, or a compensation agreement has been entered into between the parties or VCAT has determined the amount of compensation which is payable.[126] Also, in line with the MRSDA, the type of loss that compensation is payable for is limited to surface damage, deprivation of possession, loss of amenity relating to recreation and conservation values, loss of an opportunity to make a planned improvement and any decrease in market value of the owner or occupiers interest in the land.[127]

123 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 43(1)(e)(ii).
124 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 86
125 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 88(1).
126 *Petroleum Act* 1998 (Vic), s128.
127 *Petroleum Act* 1998 (Vic), s129.

In addition, under the PA, where the land affected is subject to native title, and this generates a right to compensation on just terms, in accordance with the *Native Title Act* 1993(Cth)(NTA), if the compensation payable does not amount to just terms compensation, additional compensation may be payable.[128] Further, the PA makes it clear that where a right to negotiate or an indigenous land use agreement applies in respect of a petroleum operation, the provisions of the NTA will prevail.[129]

Importantly however, the MRSDA does require the 'principles of sustainable development' be taken into account in the administration of the Act. This can provide landholders with additional bargaining power when negotiating private compensation agreements.[130] Section 2A ensures that *inter alia* community wellbeing and welfare is taken into account, and that both long and short term economic, environmental, social and equity considerations are effectively integrated into decision making.[131]

ii. Regulatory Limitations

There are a number of significant difficulties connected with the existing regulatory framework for compensation under both the MRSDA and the PA. The most obvious is that the framework does not actually direct the payment of compensation to landholders where a loss is incurred. Entering into a compensation agreement to determine the amount payable for a potential loss is not regarded as a

128 *Petroleum Act* 1998 (Vic), s129(6)(a) and (b). See also s134(5) which sets out that in determining how much compensation may be due to a native title holder, a tribunal or court may take into account a relevant amount determined or agreed as compensation under the *Native Title Act* 1993 (Cth).

129 *Petroleum Act* 1998 (Vic), s136.

130 *Mineral Resources (Sustainable Development) Act 1990* (Vic), s. 2A(1).

131 *Mineral Resources (Sustainable Development) Act 1990 (Vic),* s. 2A(2)(a) – (i).

prerequisite to the issuance of a mining licence over private land. This effectively means that where a consenting landholder subsequently encounters loss, and they have not negotiated a private compensation agreement, the landholder must bring a claim before a tribunal or court, within the statutorily prescribed three-year period.[132] This is an undesirable situation that needs to be changed because the cost and effort imposed upon private landholders, who do not enter into compensation agreements because, for example, they are unable to finalise negotiations, is extensive. The importance of the CCA process in Queensland is well established as it reduces conflict, establishes benchmark practices for the negotiation of compensation and provides greater focus on the importance of ensuring that landholder impacts are properly addressed within a public ownership framework.[133]

The type of compensation that may be included within a compensation agreement or in a claim to VCAT is limited. The existing provisions are restricted to damages or loss suffered as a direct, natural and reasonable consequence of the approval of a work plan and therefore does not extend to cover indirect losses, which may flow, for example, from environmental impacts caused by unconventional gas extraction.[134]

Under the MRSDA for example, compensation may be payable *inter alia* for deprivation of possession of part or whole of the surface of the land, damage to the actual surface of the land, damage to improvements on the land, loss of amenity, and decrease in the market value of the land.[135] Under the PA, similar types of compensation are

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132 See *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 86 and *Petroleum Act* 1998 (Vic), s 133.

133 This is discussed extensively in The Review of Heads Compensation for Land Access In Queensland, above n. 70 at 6.

134 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 85.

135 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s 85.

listed.[136]

The Victorian taskforce report recommends increasing the upper limit of the compensation threshold from $10,000 to $20,000 plus CPI adjustments for 'loss of amenity' claims whether under a registered compensation agreement or otherwise.[137] This recommendation does not deal with the core problem that arises where landholders, who have not entered into a compensation agreement, are obliged to fund their own compensation action. Entering into a compensation agreement should be mandatory, particularly for high impact mining and petroleum titles, and should be a pre-requisite to the issuance of such titles. This would ensure that landholders have the opportunity to engage in loss assessment negotiation prior to licence activities commencing which is crucial because this is the stage when they are in a strong negotiating position. If the parties cannot reach a mutual agreement on the scope and terms of the compensation agreement, it may be referred to VCAT for an objective determination.

All negotiations regarding the payment of compensation for mining and petroleum operations must be clearly separated from access and conduct arrangements.[138] Whilst it makes sense to have both arrangements included within the same agreement, yoking both together indiscriminately can create significant problems. The difficulty with the current framework under the MRSDA is that it creates the potential for mining and petroleum proponents to refuse to enter into a compensation agreement with a landholder in

136 *Petroleum Act* 1998 (Vic), s 129.

137 See Victorian Gas Market Taskforce Report, above n 11 at 18.

138 See in particular the discussion by Queensland Government, 'Land Access Code' (2010) <http://mines.industry.qld.gov.au/assets/land-tenure pdf/land_access_code_nov2010.pdf> which discusses the importance of developing strong, independent access provisions for the regulation of unconventional gas development.

circumstances where that landholder has already given written consent for access.

Other states have adopted different approaches to the Victorian framework. Queensland is probably the most advanced state in terms of its land access and compensation policy. Pursuant to the Queensland framework, *Petroleum and Gas (Production and Safety) Act* (PGPS) 2004 differentiates between 'preliminary' and 'advanced' activities of licence holders.[139] Preliminary activities are seen to have either no impact, or a negligible impact upon the landholders business or land use. Activities coming within this category include surveying, and taking soil samples. Advanced activities on the other hand can have a significant impact upon the landholders land and include drilling wells and creating disturbances to surface stock.[140]

The PGPS requires a mining proponent seeking to conduct preliminary investigations, to give the landholder an entry notice prior to entering private land, which is the subject of a mining licence.[141] The entry notice must outline the land to be entered, the entry period and the activities, which are proposed.

The PGPS requires a conduct and compensation agreement (CCA) to be entered into before the licence holder may enter private land and conduct advanced activities.[142] A conduct and compensation agreement will outline how the area which is the subject of a petroleum title, is to be accessed and how authorised activities are to be performed. Significantly, the access terms are included as a component of an agreement whose primary purpose is to address the compensation liability owed to the landowner. Hence, it has

139 *Petroleum and Gas (Production and Safety) Act* 2004(Qld), Schedule 2.

140 *Petroleum and Gas (Production and Safety) Act* 2004(Qld), Schedule 2.

141 *Petroleum and Gas (Production and Safety) Act* 2004, s 495.

142 *Petroleum and Gas (Production and Safety) Act* 2004, s 500.

been held that the access component of the agreement 'define the agreed basis for compensation and do not constitute a new right.'[143]

The agreement must outline the compensation liability owed to the landowner, the range of which is extensive and includes: any diminution of the value of the land, any deprivation of a surface estate owners possession of the surface, any reduction in land usage or in the value of any improvement on the land, any excision of specific parts of the land from usage, costs, damages or loss arising from authorized activities carried out on the land and accounting, legal or valuation costs reasonably incurred by the landowner in negotiating the conduct and compensation agreement.[144]

Where negotiations for a conduct and compensation agreement are unsuccessful, the Land Court may make a final determination.[145] It is possible, for the conduct and compensation agreement to specifically incorporate a waiver of the entry notice, in which case the entry notice need not be issued.[146] In negotiating the conduct and compensation agreement, the parties must adhere to the mandatory negotiation process set out in the PGPS.[147]

In New South Wales, the framework specifically mandates both a notice and an access agreement however, unlike Queensland, it does not make the latter dependent upon the licence having a significant impact upon a landholders land. Pursuant to the *Petroleum (Onshore) Act* 1991, an access agreement need only be entered into for a prospecting title,

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143 Sharon Christenson, Pamela O'Connor, W.D. Duncan and Angela Phillips, 'Regulation of Land Access for Resource Development: A Coal Seam Gas Case Study from Queensland' above n.20 at 117.

144 *Petroleum and Gas (Production and Safety) Act* 2004(Qld), s532(4)

145 *Petroleum and Gas (Production and Safety) Act* 2004(Qld), s 537B.

146 *Petroleum and Gas (Production and Safety) Act* 2004, s 497(1)(c)(iii)

147 *Petroleum and Gas (Production and Safety) Act* 2004, ss 535-537D.

is defined as an exploration licence or a low impact special prospecting authorities.[148] The access agreement may make provision for periods of permitted access, types of prospecting operations to be carried out on the land, environmental protections needed as a consequence of prospecting operations, the manner of resolving disputes, and the manner of varying the arrangement and compensation to be paid to any landholder as a consequence of the prospecting operations being carried out on the land.[149] Unlike the Queensland CCA, the NSW access provisions are not as expansive in terms of the range of compensation that may be covered within an access agreement, being restricted to loss flowing from prospecting authorities being carried out. Where the Land and Environment court assesses compensation however, the range of compensable heads is more extensive.[150] The Queensland CCA covers both monetary and non-monetary compensation and has the capacity to state whether it represents all or a part of the compensation liability.[151]

Drawing from both the NSW and Queensland provisions, it is clear that reform is needed in Victoria to ensure that the existing types of compensation under both the MRSDA and the PA adequately address the broader loss that landholders often experience following the issuance of unconventional gas licences. In particular, the existing provisions in Victoria make no mention of broader forms of compensation including: loss of amenity incurred as a result of a disturbance to a landholders quiet enjoyment, loss suffered to a surface activity flowing from sub-surface impacts, including the depletion of groundwater aquifers by a coal

148 *Petroleum (Onshore) Act* 1991 (NSW), ss45B(1); 69C.

149 *Petroleum (Onshore) Act* 1991 (NSW), s69DB(1).

150 This is set out in the *Petroleum (Onshore) Act* 1991 (NSW), s109 and includes: damage to surface, buildings, improvements etc arising from petroleum operations; deprivation of the possession or the use of the surface of the land; severance of parts of land, destruction, loss, injury or disturbance of stock and consequential damage.

151 *Petroleum and Gas (Production and Safety) Act* 2004, s534(1)(c).

seam gas water pumping extraction processes and future losses connected with these environmental impacts. There is also no provision for the legal and financial costs incurred by landholders as a result of entering into negotiations for a non-mandatory compensation agreement. Further, the provisions that do relate to loss of amenity are subject to a specific financial cap, which is currently $10,000.[152]

Additionally, there is currently a three-year time limit for compensation claims made beyond a compensation agreement under both the MRSDA and the PA, which needs to be revised.[153] Damage to the subsurface from unconventional gas extraction may not be evident until many years following the commencement of mining activities. This is particularly relevant for adjoining landholders who are not directly affected by the mining activities.

Finally, the quantum and type of compensation that is recoverable should not be limited in all cases to loss strictly contained within compensation agreements, as this is not the case in Queensland.[154] The importance of flexibility in this regard was reinforced by the Queensland Land court in *Peabody West Burton Pty Ltd v Mason* which concluded that the legislative framework allowed the court to 'look beyond the terms of agreement' when evaluating the disputed type and quantum of compensable loss contained within a compensation agreement.[155]

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152 *Petroleum and Gas (Production and Safety) Act* 2004, s89(3). The Victorian Gas Taskforce Report, above n.11 recommends increasing this threshold to $20,000 however neither NSW nor Queensland have a cap on loss of amenity compensation.

153 *Mineral Resources (Sustainable Development) Act 1990* (Vic), s86; *Petroleum Act* 1998 (Vic), s133.

154 As mentioned, the *Petroleum and Gas (Production and Safety) Act* 2004, s534(1)(c) specifically anticipates that a conduct and compensation agreement may not encompass all compensation liability.

155 [2012] QLD 23 (31 May, 2012). The Court notes that any attempt to assess a diminution in value within an agreement cannot be completely accurate at the date when the conduct and compensation agreement is entered into. The court provides a hypothetical example at [35]: 'if during the course of drilling activities an explorer inadvertently

7. Environmental Assessment Processes

i. Existing Environmental Assessment Processes

The third and final area of regulatory concern is the existing framework for the environmental assessment of mining licences in Victoria. This system has been significantly criticized for its lack of rigour and detail in the environmental impact assessment process and further, for the secrecy and politicization involved in the process.[156] The primary difficulty stems from the absence of any regulatory mandate for thorough and comprehensive environmental impact assessment of mining projects. Whilst the existing provisions impose some moderate environmental evaluation, as either a component of the work plan or pursuant to the planning approval process, there is no separate, credible, scientifically grounded environmental impact assessment process, which is proportionate to the scale and dimension of a proposed project. Any environmental assessment that is applicable lacks pre-determined criteria to evaluate the appropriate level of environmental impact and fails to culminate in a binding determination to approve, refuse or conditionally issue the mining title. Rather, the process is skewed towards an evaluation of whether an environmental impact assessment is required at all.[157]

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caused a fracture in an aquifer which was the major source of water supply for the subject property, and as a result of that fracture the capacity of that aquifer to hold water was severely diminished, then I would have no doubt that such hypothetical exploration activities would cause an actual diminution in the value of the subject land.'

156 Victorian Gas Market Taskforce Report, above n11 at 24 where the report concludes that despite 'the serious environmental impacts that these projects can have, the majority are not subjected to a credible EIA process that would properly identify and avoid those impacts.' See also: S. Rao, 'Reforming the Environment Assessment Process in Victoria' (2010) 1 *National Environmental Law Review* 34 and J. Glasson, R. Therival and A. Chadwick, *Introduction to Environmental Impact Assessment: Principles and Procedures* 1999 at 331 which notes the criticism of Australia's EIA process on the basis of administrative discretion and governmental secrecy.

157 Ibid. See also R. Leeson, 'EIA and the Politics of Avoidance' (1994) *Environmental Planning Law Journal* 71 at 83 where the author argues that the primary question has

The framework under the MRSDA operates so that all mining operations require an approved works plan before work under an issued title may commence.[158] A work plan for an exploration licence must describe the type of activities that the licensee proposes to carry out including: details of the potential environmental impacts, the measures proposed for their control or mitigation and proposed methods of monitoring, auditing and reporting those impacts.[159] A work plan for an exploration licence should generally be prepared in consultation with government agencies and departments having an interest in the proposed work prior to it being lodged for approval.[160]

The Minister has the power to require an environmental impact assessment to be prepared as a component of a work plan where he or she is of the opinion that the exploration activities will have a material impact on the environment, although such an assessment is not prepared as a matter of course.[161] Exploration work does not require planning approval. The MRSDA expressly exempts both an exploration and a retention licence from any planning schemes in the *Planning and Environment Act* 1987 (Vic).[162]

A work plan for a production licence is more onerous and must include plans of the proposed work, a rehabilitation plan, an environmental management plan and a community

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been 'what are the environmental impacts and how will we manage them rather than 'what are the environmental impacts and are they acceptable to us.

158 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s39(1); 40(1),(4)-(7), 42(2)(i).

159 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s40

160 For a detailed discussion on the preparation of work plans under the MRSDA see the outline in the Victorian Gas Taskforce 72 Report, above n. at 126

161 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s41A.

162 This is set out in *Mineral Resources (Sustainable Development) Act* 1990 (Vic)s 43(3) which allows work authorized under a work plan for an exploration or retention licence to proceed despite anything in any planning scheme approved pursuant to the *Planning and Environment Act* 1987 (Vic).

engagement plan.[163] Further, the *Planning and Environment Act* 1987 (Vic) requires a planning permit to be issued where mining operations are to be conducted.[164] Where, however, an environment effects statement (EES) has been issued pursuant to the *Environment Effects Act* 1978 (Vic), planning approval for a production licence is not required.[165] This means that the issuance of a production licence in Victoria is amenable to either planning approval or an environmental effects statement, but not both.

The environment effects process, unlike the planning approval process, provides no right to challenge proposals issued.[166] Further, very few environmental effects statements have actually been prepared for mining projects.[167] This is largely a consequence of the fact that the process is highly discretionary and dependent upon non-binding, unenforceable guidelines, which confer upon the Minister for Planning 'virtually unlimited discretion' to decide whether an EES is required for a project.[168] Furthermore, and perhaps even more significantly, the EES process produces a recommendation, which is not binding on decision-makers.[169]

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163 *Mineral Resources (Sustainable Development) Act* 1990 (Vic), s40(1AA); *Mineral Resources (Sustainable Development) Regulations* r 25, Schedule 13.

164 The Victorian Planning Provisions, set up in accordance with Part 1A of the *Planning and Environment Act* 1987 (Vic), set out that a planning permit is required where land is to be used and developed for mining: Clause 52.08.

165 *Mineral Resources Sustainable Development Act* 1990 (Vic), s42(6),(7), Victorian Planning Provisions, Clause 52.08. The Minister does, however, have discretion to determine that planning approval is required: see DSE Ministerial Guidelines for Assessment of Environmental Effects under the *Environment Effects Act* 1978 (Vic), 2006 and *Planning and Environment Act* 1987 (Vic), Part 3, Division 2.

166 Under the *Planning and Environment Act* 1987 (Vic), a person may object to the issuance of a planning permit and may appeal to VCAT if the permit is granted: *Planning and Environment Act* 1987 (Vic), s82.

167 According to the Environment Defenders Office, above n 1, 24, over the last five years, there have only been three mining projects which were required to prepared an EES even though 72 mining licences were issued during this period: Victorian Environment Defenders Office, 'Reforming Mining Law in Victoria'.

168 See the discussion by S. Rao, 'Reforming the Environment Assessment Process in Victoria' above n 83.

169 *Environmental Effects Act* 1978 (Vic), s 8C.

In essence, an EES may be required if the Minister declares a project to constitute a 'public works' that has a significant effect on the environment.[170] Guidance as to the type of projects that come within this category is set out in non-binding guidelines.[171] These guidelines indicate that a 'significant effect on the environment' involves a multi-layered evaluation of the:

- character of potentially affected environmental assets;
- geographic occurrence of the environmental assets;
- values or importance of the environmental assets, based on expert knowledge, relevant policy and evidence of social values;
- potential magnitude, extent and duration of adverse effects on environmental assets in the short, medium and longer term, as a result of the development, operation and decommissioning of a project;
- potential for more extended adverse effects in space and time, as a result of interactions of different effects and environmental processes affecting environmental assets.

The existence of some or even all of these environmental effects does not automatically mean that an EES will be required. The guidelines make it clear that further consideration must also be given to the likelihood of such environmental effects actually occurring.[172]

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170 *Environmental Effects Act* 1978 (Vic), ss3, 4(1), 8(4).

171 *Environmental Effects Act* 1978 (Vic), s10.

172 This is also set out in the: Ministerial Guidelines for Assessing Environmental Effects under the *Environmental Effects Act* 1978 (Vic). Department of Sustainability and Environment, 7th edition, 2006, 6-7. The guidelines also indicate that a combination of two or more specifically listed effects, including potential loss of an endangered species, major effects on social or economic well-being due to direct or indirect displacement of non-residential land usage or residential access, chronic health or safety issues due to air, water or chemical hazards will warrant referral of a project.

It is axiomatic that within this framework, the potential for coal seam gas projects coming within the application of the MRSDA to avoid strong environmental impact assessment is strong. The EES process is weak as guidelines are not mandatory and the environmental uncertainty that is inherent in coal seam gas extraction, in particular with respect to the longer term consequences for ground water connectivity, chemical contamination and fugitive emissions, make it difficult to determine the exact environmental impact at the point when a mining title is applied for.[173] Despite this uncertainty, projected environmental effects continue to be evaluated, if at all, during these early application stages.[174]

The absence of credible environmental impact assessment and the lack of any identifiable focus within the *Environmental Effects Act* 1978 (Vic) upon internationally established principles of ecologically sustainable development, which would equip the act with the capacity to better incorporate and respond to the core social, environmental and economic imperatives connected with the expansion of unconventional gas mining in Victoria, make the existing regulatory framework for environmental assessment fundamentally inadequate.[175]

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173 For an early review of the *Environmental Effects Act* 1978 (Vic) see P. Barber, 'Environmental Impact Assessment in Practice: The Victorian Environmental Effects Act' (1998) 17 *Australian Mineral and Petroleum Law Journal* 191 at 193 where the author notes: 'The object of the whole EES exercise, from the proponent's point of view, is to demonstrate that all environmental issues can be managed or mitigated so that they will not be 'significant' and that thepositive advantages of the project outweigh any perceived or actual disbenefits to the community or the environment.'

174 See *Environment Effects Act* 1978 (Vic), ss3, 6, 8(1), (3) and (4). See also Ministerial Guidelines for assessment of environmental effects under the Environmental Effects Act 1978, 5-12.

175 It has been argued that it is imperative that the environmental assessment process under the *Environment Effects Act* 1978 (Vic) be underpinned by the principles of ecologically sustainable development which are widely recognized in Australia and internationally. See S. Rao, 'Reforming the Environmental Assessment Process in Victoria' above n 83, 37 where the author notes that the Australian government formally committed to endorsing the principles of ecologically sustainable development in land-use regulation and decision-making in 1992 pursuant to the *Intergovernmental Agreement on the Environment,* 1st May, 1992, Schedule 2. Note also that the principles

It is possible, but unlikely that a production licence issued under the MRSDA may, where an EES is not required, be subject to a planning permit issued pursuant to the *Planning and Environment Act* 1987 (Vic).[176] Matters that a responsible authority must take into account in assessing whether to issue a planning permit include: the relevant planning scheme, objectives of planning in Victoria and objections and other submissions by other authorities. In 2013, the *Planning and Environment Act* 1987 (Vic) was amended to incorporate further assessment of environmental issues in the issuance of a permit. The provisions now require the responsible authority to take into account 'any significant effects' that the mining project may have on the environment including as any 'significant social or economic effects' that the project might have.[177]

Finally, pursuant to the National Partnership Agreement on CSG and Large Coal Mining Development (NPA), Victoria agreed to refer all CSG development proposals to the Independent Expert Scientific Committee (IESC) for assessment. The IESC was established under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) to provide state governments with expert scientific advice relating to CSG and large coal mining proposals that may have a significant impact on water resources. Hence environmental review of CSG, but not shale or tight gas projects, may occur pursuant to the IESC processes so this functions as an additional protection.

Shale and tight gas licences issued under the PA may be

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of ESD are incorporated into the *Mineral Resources (Sustainable Development) Act* 1990 (Vic).

176 See the discussion in the Victorian Gas Taskforce Report above n. 72 at 128 where the authors note: 'It is considered likely that any proposal to mine / produce unconventional gas would require an assessment under the *Environment Effects Act 1978* (EEA) rather than proceed through a planning permit process.'

177 *Planning and Environment Act* 1987 (Vic), s60(1)(a)-(f).

subject to either the *Environmental Effects Act* 1978 or the *Planning and Environment Act* 1987 (Vic) but probably the former. There is no capacity for shale and tight gas projects to be evaluated under the EPBC because the matter of national environmental significance is expressly restricted to water resources impacted by coal seam gas development.[178]

Further environmental assessment provisions may be relevant where the unconventional gas project comes within the application of the PA. The chief factors to be considered when determining whether to issue a petroleum exploration licence under the PA are the merits of the work program proposed and the likelihood that the work program will be carried out.[179] Details of the technical qualifications of applicants and financial resources must also be submitted with the application.[180] The Minister then has a broad discretion to either grant or refuse an exploration permit.[181]

A work program, a petroleum production development plan and, where relevant, a storage development plan must be submitted when mining proponents apply for a production licence under the PA.[182] The work program must outline the work intended, the structure of the work, and the proposed guidelines for the various phases of the work.[183] A petroleum production development plan requires applicants to outline how petroleum production will be conducted within the permit area including the equipment and facilities to be used and a description of the relevant and existing geological and reservoir data and how that data has been

178 *Environmental Protection Biodiversity Conservation Act* 1999 (Cth), s24D.
179 *Petroleum Act* 1998 (Vic), s20B.
180 *Petroleum Act* 1998 (Vic), s20.
181 *Petroleum Act* 1998 (Vic), s20.
182 *Petroleum Act* 1998 (Vic), Part 5, Division 6 and 7; Part 7, s97.
183 *Petroleum Act* 1998 (Vic), s97.

interpreted. [184]

Whilst no specific environmental assessment process is mandated for either petroleum exploration licences or production licences issued under the PA, provision is given for the Minister to impose conditions upon grants, which 'concern the protection of the environment.'[185] Applicants must also submit an environmental management plan, which describes the environment and any relevant cultural, social, ecological or biological aspects of the environment that may be affected by the petroleum operation.[186] The plan must identify and evaluate the environmental effects and risks that may arise, whether directly or indirectly, from the normal activities of the petroleum operation and assess the risks of potential effects on the environment resulting from 'reasonably possible' activities in relation to the normal activities of the petroleum operation.[187] The plan must establish environmental performance standards against which the activities of the holder may be measured, in order to protect the environment and identify systems, practices and procedures to ensure that potential adverse environmental effects arising from the petroleum operation are eliminated or minimized as far as is reasonably practicable.[188]

Whilst comprehensive in nature, the environmental management plan remains nevertheless fundamentally different to an environmental impact assessment. The primary difference lies in the fact that the Minister retains full discretion to issue a petroleum exploration permit or a production licence despite the existence of identified environmental risks under an environmental management plan. Provided the plan identifies specific measures taken

184 *Petroleum Regulations* 2011, r.16.

185 *Petroleum Act* 1998 (Vic), s100(3)(d).

186 *Petroleum Regulations* 2011, r.8

187 *Petroleum Regulations* 2011, r.9.

188 *Petroleum Regulations* 2011, r11.

by the mining proponent to minimize the effect of such risks, the plan is compliant with the regulatory requirements and an application may be approved. By contrast, an environmental impact assessment is not purely prescriptive as it can influence the decision as to whether or not a project should be approved and the nature of any environmental management conditions which may be imposed on petroleum titles.

Shale or tight gas licences issued under the Victorian PA can potentially have a dramatic impact upon the environment, particularly given the fact that most shale gas extraction is dependent upon the use of hydraulic fracturing technology.[189] Issuance of such licences under the PA may be approved provided the mining proponent has illustrated, as much as is reasonably practicable, how they will reduce the risk of potential adverse effects. The possibility that such risks are either too great to be undertaken or, that they may not be reasonably reduced, is not properly accounted for under the existing environmental regulation provisions of the PA.

ii. Regulatory Limitations

The existing environmental assessment process for mining applications in Victoria is patently inadequate. The EES process is discretionary, non-binding and has an infrequent application to mining and petroleum projects. The planning approval process contains little more than bare environmental evaluation and the environmental management plan that is operative under the PA has more of an administrative than a substantive focus. The existing framework lacks a strategic, transparent, compulsory,

[189] For an excellent discussion on this see: M Walton, 'Queensland shale gas – a rocky road ahead for the new kid on the block?' above n.13.

assessment process that is capable of fully and comprehensively evaluating the cumulative risks of adverse environmental impacts and, in light of this evaluation, making an informed, participative and deliberative decision regarding the suitability the mining application. Many of environmental laws greatest concerns are caused by 'the cumulative effects of many actions, each of which contributes only a small increment to the larger problem.[190]

The absence of a rigorous, informed environmental review process is particularly disturbing with the expansion of the unconventional gas industry in Victoria. The extraction of unconventional gas has the potential, as one United States commentator has noted, to generate 'catastrophic environmental implications'.[191] The recommendations of the Victorian Taskforce Report go some way to address these limitations. Recommendation 4 of the Taskforce Report suggests establishing an independent water science committee, chaired by an independent eminent scientist, who would oversee a water science and monitoring program and provide independent advice on water quality and other environmental issues relevant to gas industry exploration and development operations.

The Taskforce concluded that where aquifers are connected, all users should be required to hold a water licence and be subject to coordinated management under the *Water Act 1989*. This would mean amendments are required to a number of Acts (including the *Petroleum Act 1998*, *Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic)* and *Offshore Petroleum and Greenhouse Gas Storage Act 2006*

190 See: D. Owen, 'Critical Habitat and the Challenge of Regulating Small Harms' (2012) 64 Florida Law Review 141 at 143 (citing W.E. Odum, 'Environmental Degratation and the Tyranny of Small Decisions' (1982) 32 *Bioscience* 728.

191 Ross H. Pifer, 'A Greener Shade of Blue?: The Technology and Shale Revolution (2013) 27 *Notre Dame Journal of Law Ethics and Public Policy* 131, 134.

(Cth)) to require groundwater extraction to be licensed under the *Water Act 1989*.
Further, a water science and information program is needed for baseline information and ongoing monitoring. Reliable baseline information is a crucial aspect associated with assessing the potential impact of gas projects on water resources. The taskforce recommended building a baseline knowledge of water resources using data gathered by proponents during the early exploration phase in Victoria. Collaboration between industry and regulators in the sharing of information will improve the information base and the cost-effectiveness of information gathering. Industry information should also be made publicly available on the websites of relevant agencies

Whilst these recommendations have an explicit water focus, leaving 'other' environmental concerns including chemical contamination, fugitive emissions, and the environmental impact of hydraulic fracturing to be dealt with as an endnote, they nevertheless emphasize the increasing community concerns regarding water depletion and contamination associated with unconventional gas extraction.

8. Conclusion

This submission has argued that the regulatory framework for unconventional gas mining in Victoria needs to be improved in three key areas: land access, compensation and environmental assessment. Land access entitlements are a fundamentally important issue for unconventional gas development because the expansion of mining licences into areas traditionally associated with rural and agricultural industries has generated unprecedented ownership conflict. This is due, in part, to the fact that unconventional gas has

expanded into areas that have never before experienced mining development. It is also due to the fact that the legislative framework, particularly in Victoria, is confusing and non-transparent.

It is imperative that private landholders understand the ownership framework and be further protected when access entitlements held by mineral and petroleum titleholders are exercised. A regulatory framework that clearly articulates the nature and scope of the access entitlements and introduces mandated access and compensation agreements, supported by a focused land access code, benchmarking good practice standards for unconventional gas development would be optimum. It would generate certainty and productivity and reduce the frequency and potency of land access disputes.

Further, landholders that experience significant loss and injury as a result of unconventional gas projects need to be properly protected by mandatory compensation agreements, with broad ranging heads of compensation. The possibility of a landholder being financially incapable of bringing their own compensation claim or, being out of time to bring such a claim, needs to be urgently redressed.

Finally, the extraction of unconventional gas can have dramatic environmental impacts and this potential needs to be supported by a regulatory framework that mandates firm, comprehensive environmental review. The unconventional gas revolution has been, in many respects, a technological revolution because mining proponents are able, for the first time, to extract gas from reservoirs that were previously regarded as impenetrable.[192] The long-term effect of this technology on the environment remains unclear. These

[192] Pifer, above, where the author outlines the scope of this technological revolution in the United States.

uncertainties need to be managed strategically through the implementation of a strong, transparent and authoritative environmental assessment regime which doe not exist under the current framework. Rather, the existing provisions reflect an outdated process, where environmental assessment is treated as a matter of administrative compliance instead of critical strategic importance.

Both the Victorian Gas Taskforce Report and the supplementary report have articulated the tension that exists between the need for regulatory certainty for the unconventional gas industry in order to encourage investment in new gas resources and the importance of developing stronger regulatory controls in response to growing social and environmental concerns.[193] A reformed regulatory framework must ensure that the economic significance of unconventional gas exploration and production for Victoria is carefully balanced alongside core social and environmental protections. Improving the regulatory management of land access, compensation and environmental assessment will help to improve the balance in this fragile equilibrium.

193 Victorian Gas Market Taskforce Report, above n 11 at 20.