



Government of **Western Australia**
Department of **Mines and Petroleum**

Department of Mines and Petroleum Response to Report:
'Regulation of Shale, Coal Seam and Tight Gas Activities
in Western Australia'

31 October 2011

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Onshore Gas in Western Australia

Onshore gas includes 'unconventional gas' which is a term that describes tight, shale and coal seam gases. Unconventional gas differs from conventional gas because the characteristics of the rock formations prevent the gas from flowing freely through the rock during recovery.

Conventional gas resources are contained in sandstone and carbonate rocks that allow the gas to flow freely. For unconventional gas the rock formations need to undergo hydraulic fracture stimulation (also known as fracking) to release the gas and enable recovery. Hydraulic stimulation has been used in the oil and gas industry in Western Australia for the past 50 years.

Unconventional gas resources have been known around the world for decades. Advances in horizontal drilling and hydraulic stimulation technology in the past two decades have made unconventional gas commercially viable. These techniques have resulted in an increase in the development of unconventional gas resources, delivering cost effective energy to meet global needs.

In Western Australia, extensive onshore unconventional gas resources provide an opportunity to secure our domestic energy future. The State's resources of shale gas, estimated to be twice that of current conventional gas¹, occur in deep rock formations typically between 1500 and 5000 metres below the surface, well below groundwater sources. Western Australia currently has no known, potentially commercial, coal seam gas resources because of the State's geology and character of its coals. This limits Western Australia's exposure to issues of groundwater contamination, high volumes of produced water and associated salt disposal confronting eastern Australian and overseas coal seam gas production.

Regulation of Onshore Gas in Western Australia

The Department of Mines and Petroleum (DMP) is responsible for regulating extractive industries in Western Australia; ensuring safety, environmental practice and resource management meet relevant legislation, regulations, guidelines and policies that reflect community expectations.

DMP administers onshore petroleum and geothermal activities, which are regulated through the *Petroleum and Geothermal Energy Resources Act 1967*, the *Petroleum Pipelines Act 1969*, the Onshore Schedule² and the Geothermal Onshore Schedule³.

DMP is responsible for assessing all drilling applications and associated safety, environment and resource management plans. The assessment of these plans determines whether an application is approved or declined, and outlines any conditions that must be met. These processes ensure that well integrity is maintained, thus protecting groundwater.

Onshore gas activities must further comply with other legislation that protects public health, the environment and water resources. These include, but are not limited to:

- *Environmental Protection Act 1986*, which is administered by the Environmental Protection Authority and Department of Environment and Conservation.
- *Rights in Water and Irrigation Act 1914*, which is regulated by the Department of Water.
- *Environmental Protection and Biodiversity Conservation Act 1999*, which is a commonwealth legislation administered by the Australian Government Department of Sustainability, Environment, Water, Population and Communities.

¹ <http://www.eia.gov/analysis/studies/worldshalegas/>

² Schedule of Specific Requirements for Onshore Exploration and Production 1991

³ Schedule of Geothermal Exploration and Production Requirements 2009

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Strengthening Regulatory Framework in Western Australia

There is much community interest in the unconventional gas industry in Western Australia, particularly the use of hydraulic fracture stimulation. This interest has been heightened by issues in eastern Australia and overseas, where surrounding activities are often in shallow reservoirs with a small separation from groundwater resources.

The Western Australian Government is committed to a regulatory regime that ensures responsible development of this resource, while protecting the environment, groundwater resources and public health. A number of recent initiatives have been undertaken to ensure WA's regulatory framework meets global best practice, while being supported by appropriate and transparent processes, standards and guidelines. Three of these initiatives are summarised below.

1. Independent Review Report

DMP commissioned an independent review of the regulatory framework for shale, coal seam and tight gas activities in Western Australia.

The reviewer, Dr Tina Hunter from Bond University, is an expert in petroleum law and the activities of the petroleum industry – concluded that the current regulatory processes are stringent and supported by skilled and dedicated staff. However there are areas that should be further strengthened. Dr Hunter identified the need to improve legal enforceability through developing new environmental and resource management regulations.

2. Environmental Protection Authority Advice

The Environmental Protection Authority (EPA) has provided guidance to the Government and industry, on the regulation of onshore gas activities through Environmental Protection Bulletin No. 15⁴.

The EPA recognised the lower risks and deeper hydrocarbon reservoirs for onshore Western Australia when compared with other jurisdictions and examined DMP's regulation of the activities. It decided not to formally assess a number of referred onshore gas proposals.

The EPA noted that it will maintain a watching brief on the development of DMP regulatory arrangements, including working with DMP to ensure the community and industry has appropriate information and guidance.

3. Interagency Working Group

DMP has established an interagency working group to ensure a coordinated and comprehensive approach to the regulation of onshore gas activities. The State Government Departments of Water, Environment and Conservation, Health, Agriculture and Food and Office of the Environmental Protection Authority are represented on the working group.

DMP has reviewed Dr Hunter's report, the EPA's advice and input from the interagency working group and is implementing a comprehensive reform package to strengthen the regulatory framework for onshore gas activities. Additional background information about the report and author can be found later in this document.

In summary, the DMP reform package will seek to achieve the following outcomes:

1. Propose legislative amendments to:
 - a) Strengthen enforcement provisions for regulators
 - b) Mandate full disclosure of chemicals
 - c) Mandate public release of approved Environment Management Plans.
2. Revise DMP policies, procedures, guidelines and activities to:
 - a) Improve community consultation by industry participants
 - b) Target compliance auditing plan for onshore gas activities
 - c) Improve consultation agreements with other government agencies.

⁴ <http://www.epa.wa.gov.au/announcements/Pages/EPB15-Hydraulicfracturingofgasreserves.aspx?pageID=20&url=announcements>

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Background - Independent Review Report

DMP commissioned the independent report titled 'Regulation of Shale, Coal Seam and Tight Gas Activities in Western Australia' (the Report) by Dr Tina Hunter. The Report provides an independent assessment of the existing regulatory framework governing the onshore gas industry in Western Australia, under the *Petroleum and Geothermal Energy Resources Act 1967 (WA)* (PAGERA).

The Report found that current DMP processes are adequate to ensure the management of risk across the environment, workforce safety and resource management, due to rigorous assessment by highly skilled and dedicated staff.

"The staff that execute the assessment of a drilling program are exceptionally experienced, committed to ensuring well integrity and best practice in well design. Furthermore, WADMP utilise a set of rigorous internal processes to assess the compliance of the integrity of the proposed drilling program." (The Report, page 22).

The Report recommended strengthening of current legislation through a number of enhancements to regulations. New Environment and Resources Regulations are currently being prepared by DMP and are expected to take effect in 2012.

The Report recommended improved transparency through the public release of approved Environment Management Plans (EMPs), regulatory processes and compliance measures. New Environment and Resources Regulations will seek to enforce full public disclosure of EMPs for all onshore gas exploration and production activities.

While regulation amendments are being finalised, DMP is encouraging companies to publicly disclose their EMP including all chemicals used in hydraulic fracturing. Disclosure via company websites is being pursued with the support of the WA office of the industry peak body, Australian Petroleum Production and Exploration Association (APPEA).

About the Author

Dr Tina Hunter is a Post-Graduate Teaching Fellow at Bond University in Queensland, specialising in petroleum law and regulation, mining law, resources law, land and property law, legal philosophy and jurisprudence.

Dr Hunter recently completed her Doctoral thesis 'Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources: A Critical Foundation Analysis'. Recent published works completed by Dr Hunter include;

- a) Australian Offshore Petroleum Regulation after the Varanus Island Explosion and the Montara Blowout – Drowning in a Sea of Federalism, *Australian and New Zealand Maritime Law Journal*, 2011.
- b) Sustainable Socio-Economic Development of Petroleum Resources: Is it Possible, *Journal of Energy and Natural Resource Law*, 2011.
- c) The BP Oil Spill and Australia, Is There a Connection? *The National Legal Eagle*, 2011.

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Recommendations Response

The Report comprises fifteen recommendations, each recommendations and corresponding DMP response has been summarised in the table. Note: EMP refers to the Environment Management Plan required by DMP for assessment and approval before an associated activity can proceed.

Recommendation	DMP Response	Current Approach	Outcome and Future Actions
<p>Recommendation 1: The Western Australian Department of Mines and Petroleum should develop a policy/strategy for the management of produced water from fracking processes. This strategy should be based on best practice, taking into (account) domestic and international experiences.</p>	Agreed	<p>DMP currently requires that each operator detail the proposed method for managing produced water⁵, within their EMP.</p> <p>DMP has established an interagency working group to improve coordination across government to identify opportunities for strengthening policy and legislative settings and ensure DMP has access to relevant expertise.</p>	<p>DMP will publish onshore guidelines for EMPs which clarify that produced water must be addressed in detail in the EMP. This will include a requirement for the proponent to apply best practice to minimise any environmental impacts.</p> <p>DMP expects to release for stakeholder consultation, the guidelines for EMPs in parallel with the consultation for the Environment Regulations.</p> <p>The new Environment Management Regulations and EMP guidelines are expected to be released for stakeholder input by the end of 2011.</p> <p>These regulations and EMP guidelines are anticipated to be in place in 2012.</p>
<p>Recommendation 2: In implementing a management strategy for the production of shale gas, the Western Australian Department of Mines and Petroleum should ensure a produced water management plan is integrated into the whole petroleum chain, including individual well abandonment and field abandonment.</p>	Agreed	See comments for Recommendation 1, above.	<p>DMP will publish specific onshore guidelines for EMPs which clarify that produced water must be addressed in detail in the EMP. The guidelines will be prepared in consultation with the Department of Water, Environmental Protection Authority and the Department of Environment and Conservation.</p>
<p>Recommendation 3: The Western Australian Department of Mines and Petroleum should provide full, transparent disclosure of all chemicals used in WA fracking operations. This disclosure should be made available on the WADMP web site.</p>	Agreed	<p>DMP requires that companies provide in their EMPs, the Material Safety Data Sheets for the chemicals used in fracking. Existing legislation prevents DMP from publicly releasing EMPs.</p> <p>DMP is encouraging operating companies to publicly disclose EMPs and in particular chemicals used in fracking.</p>	<p>DMP will continue to require that chemicals used in fracking are included in EMPs, and will propose legislative amendments to allow DMP to publish approved EMPs on its website, while protecting personnel and commercially sensitive information.</p>

⁵ Produced water: is water produced within shallow or deep aquifers and may also include water co-produced with hydrocarbons.

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Recommendation	DMP Response	Current Approach	Outcome and Future Actions
<p>Recommendation 4: The Western Australian Department of Mines and Petroleum address the issue of conflicting land use and land access in its management of shale gas operations throughout the whole petroleum chain. This should be addressed through</p> <p>1. Legislative provisions contained within the PAGERA (objects clause)</p> <p>2. A pre-emptive land use management strategy developed in consultation with relevant stakeholders and communities.</p>	<p>1. Not Agreed</p> <p>2. Agreed (in part)</p>	<p>1. It is not the practice in Western Australia to include objects⁶ clauses in legislation.</p> <p>2. DMP will continue to ensure that industry exercises its responsibilities when dealing with landholders while recognising that petroleum in Western Australia is considered a strategic resource, and that landholders are legally entitled to compensation for actual losses incurred. Petroleum operators are also required under the PAGERA not to cause undue harm in the conduct of their operations.</p>	<p>1. The proposed Resource Management and Environment Management Regulations currently being drafted will avoid the need for objects clauses within the Act.</p> <p>2. DMP together with the WA office of APPEA, are encouraging petroleum title holders to constructively engage landholders and the community throughout the life of a project.</p>
<p>Recommendation 5: The Schedule of Onshore Exploration and Production Requirements – 1991 should be amended to include the appropriate definition of 'formation' or the like to encompass shale gas formations yielding a gas.</p>	<p>Agreed (in principle)</p>	<p>DMP currently applies a broad interpretation of the Schedule that considers 'formations' to include any body that will yield gas. This interpretation includes shale gas.</p>	<p>DMP will include in the new Resource Management Regulations (currently being drafted) an appropriate definition of the gas source 'formation'.</p> <p>These regulations are expected to be released for stakeholder input by mid 2012.</p> <p>The new regulations are anticipated to be in place in 2012.</p>
<p>Recommendation 6: The Western Australian Department of Mines and Petroleum address the issue of field sterilisation use in its management of shale gas operations throughout the whole petroleum chain. The optimal recovery of resources should be included as an objects clause in PAGERA.</p>	<p>Agreed (in part)</p>	<p>Presently, field development plans incorporate field sterilisation issues along with the optimum recovery of the resource. It is not the practice in Western Australia to include objects clauses in legislation.</p>	<p>DMP is preparing new Resource Management Regulations which will specifically address field sterilisation⁷ issues. The new Resource Management Regulations are expected to be released for stakeholder input by mid 2012.</p> <p>These new Resource Management Regulations will avoid the need for objects clauses. In Western Australia to include objects clauses in legislation.</p>

⁶ Objects clause: is a provision, often at the beginning of a piece of legislation, outlining the underlying purposes of the legislation and can be used to resolve uncertainty and ambiguity.

⁷ Field sterilisation: refers to practices or procedures that may lead to sub-optimum recovery of hydrocarbons.

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Recommendation	DMP Response	Current Approach	Outcome and Future Actions
<p>Recommendation 7: The Western Australian Department of Mines and Petroleum Safety Branch, in conjunction with the Petroleum Division, undertake an internal assessment of the Safety process to ensure that there are complementarities and the current safety regulations apply across the petroleum chain for onshore shale gas activities.</p>	Agreed	<p>The Western Australian Government through DMP has committed to overhauling the way safety and health in the resources industry is regulated.</p> <p>A specific program (Reform and Development at Resources Safety - RADARS) is in place to progress safety management across the resources sector. RADARS information is available online at http://www.dmp.wa.gov.au/9856.aspx.</p>	DMP will undertake an internal assessment of the safety process to ensure that there are complementarities and the current safety regulations apply across the petroleum chain ⁸ for onshore gas activities. This will ensure the integration of regulatory measures within DMP.
<p>Recommendation 8: The Western Australian Department of Mines and Petroleum undertake to write environmental regulations to regulate onshore petroleum activities, including the recovery of coal seam gas. The creation of such regulations should be a priority to ensure enforceability of the Environmental Management Plan.</p>	Agreed	The DMP has already prioritised the finalisation of these onshore environmental regulations.	<p>The new Environment Management Regulations are expected to be released for stakeholder input by the end of 2011.</p> <p>These regulations are anticipated to be in place in 2012.</p>
<p>Recommendation 9: The WADMP undertake to plan for succession, in the Resources Branch of the Petroleum Division, including the capture of the knowledge and experience of senior petroleum engineers, geologists and geophysicists.</p>	Agreed	A new senior management role has been created and filled in the Petroleum Division. DMP has also engaged an external human resources advisor to assist in the identification of future skill requirements, and a retention and recruitment strategy for the Division.	The review by the human resources consultant will identify any skills needs and provide strategies for improved succession planning and retention of technical knowledge. This review will be concluded by November 2011.
<p>Recommendation 10: The WADMP undertake to write resource regulations to regulate onshore petroleum activities, including the recovery of coal seam gas.</p>	Agreed	DMP is preparing regulations to cover all oil and gas resources including the recovery of coal seam gas. These new Resource Management Regulations are to provide greater transparency, certainty and enforcement provisions.	<p>The new Resource Management Regulations are expected to be finalised following stakeholder input by mid 2012.</p> <p>These regulations are anticipated to be in place in 2012.</p>
<p>Recommendation 11: The WADMP undertake to capture in written form well design, history and experience to ensure that this information is committed to corporate memory.</p>	Agreed (in principle)	<p>DMP currently maintains a detailed, publicly available well data system in DMP's online Petroleum and Geothermal Information System (WAPIMS).</p> <p>All well designs from planning to completion/abandonment are submitted for approval to DMP and these are stored in the DMP Records Manager system.</p>	The high standard of WAPIMS data and records management will be maintained.

⁸ Petroleum chain: petroleum activities from exploration, drilling, development, production and decommissioning.

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<p>Recommendation 12: The WADMP ensure the inclusion of management of produced water from abandoned wells in any proposed Environment Regulations and the Resource Management Regulations.</p>	<p>Agreed</p>	<p>EMPs are currently required to identify any potential environmental effects the proposed activities may have, and provide the procedures to manage, monitor and mitigate potential incidents.</p>	<p>The appropriate control for produced water management will be included in the new Environment Management and Resource Management Regulations. This will cover activities of well abandonment.</p> <p>DMP will publish specific onshore guidelines for EMPs, which clarify that produced water must be addressed in detail in the EMP. The guidelines will be prepared in consultation with the Department of Water, Environmental Protection Authority and the Department of Environment and Conservation.</p> <p>The new Environment Regulations will be released for stakeholder input by end of 2011, and Resource Management Regulations and guidelines are expected to be released for stakeholder input by mid 2012.</p> <p>Both regulations and guidelines are anticipated to be in place in 2012.</p>
<p>Recommendation 13: The PAGERA requires amendment to incorporate field abandonment. The requirements for field abandonment should also be incorporated into the proposed Environment Regulations and the Resource Management Regulations.</p>	<p>Agreed</p>	<p>DMP is drafting regulations that will cover requirements for field abandonment.</p>	<p>Field abandonment will be included in the new Resource Management Regulations and Environment Regulations.</p> <p>The new Environment Regulations will be released for stakeholder input by end of 2011, and Resource Management Regulations and guidelines are expected to be released for stakeholder input by mid 2012.</p> <p>Both regulations and guidelines are anticipated to be in place in 2012.</p>
<p>Recommendation 14: The WADMP develop a standard Petroleum and Land Access process overview for the abandonment of a field.</p>	<p>Agreed</p>	<p>Current onshore regulations and procedures administered by DMP mirror offshore petroleum legislation decommissioning guidelines. The process has been developed and added to the Petroleum Quality Management System. DMP is in the process of strengthening regulations to cover field abandonment.</p>	<p>New Resource Management and the Environment Management Regulations will address onshore decommissioning through a field lifecycle process (petroleum exploration, development, production and decommissioning). An overview of this process will be provided upon the completion and implementation of the new Resource Management Regulations, and Environment Management Regulations.</p>

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Recommendation	DMP Response	Current Approach	Outcome and Future Actions
<p>Recommendation 15: The WADMP should maintain vigilance in the processes, standards and number of applications in relation to shale gas extraction to ensure that a LNG Enforcement Unit is established if required.</p>	<p>Agreed (in principle)</p>	<p>DMP undertakes environment and safety compliance auditing of activities as part of its regulatory role.</p> <p>In addition, reporting of operational and environmental performance is required of proponents.</p>	<p>DMP will continue to undertake a robust approach and commit resources to ensure compliance through auditing, inspections and enforcement.</p> <p>If WA shale activity is significantly large, DMP would consider undertaking a task-force approach to coordinate regulation across government agencies.</p> <p>DMP has an existing enforcement unit and enforcement procedures to address non-compliance. DMP does not propose to replicate the Queensland LNG Enforcement Unit, which monitors coal seam gas (CSG) operators in that state as these functions are already undertaken by DMP as Lead Agency.</p>



Government of Western Australia
Department of Mines and Petroleum
Mineral House, 100 Plain Street
East Perth, Western Australia 6004

Tel: +61 8 9222 3333
Fax: +61 8 9222 3862
Email: dmp@dmp.wa.gov.au
Web: www.dmp.wa.gov.au

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