



Australian Government
**Department of Industry,
Innovation and Science**

Secretary

Justice Rachel Pepper
Chair
Scientific Inquiry into Hydraulic Fracturing
in the Northern Territory
GPO Box 4396
DARWIN NT 0801
Email: fracking.inquiry@nt.gov.au

Dear Justice Pepper

The Department of Industry, Innovation and Science (Department) thanks the independent expert scientific panel (the Panel) for the opportunity to provide a submission to the *Scientific Inquiry into Hydraulic Fracturing in the Northern Territory* (Inquiry). The Department supports the science-based approach the Inquiry is taking to consider and address community concern about the unconventional gas industry, specifically hydraulic fracturing.

The unconventional gas industry is an important source of gas supply for the domestic gas market and for the production of liquefied natural gas (LNG) for export from Queensland. The Australian Government acknowledges there are community concerns about the risks and impacts of onshore gas development and hydraulic fracturing. These concerns are taken seriously by governments and significant research is being undertaken to understand and address them. Experience in Australia has shown that existing regulatory frameworks support co-existence of onshore gas development with other land uses while affording high levels of protection to the community, workers and the environment.

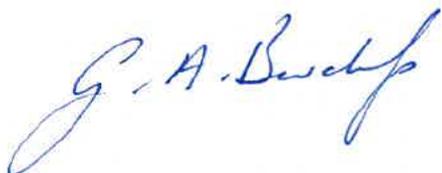
A key objective of the Government's energy policy is to maintain a secure, affordable and sustainable energy supply. The Government takes a balanced approach to the development of onshore gas and does not support State and Territory blanket bans or moratoria. Instead, it is the Government's position that gas supply security should primarily be achieved through the market with flexible regulatory frameworks that respond to changing market conditions. This position is reaffirmed in the Government's Domestic Gas Strategy (released in April 2015) and is consistent with outcomes of recent investigations, such as the 2016 Australian Competition and Consumer Commission's (ACCC) Inquiry into the east coast gas market.

In August 2016, the Council of Australian Governments Energy Council released its Gas Supply Strategy (GSS) Implementation Plan for Collaborative Actions. The GSS aims to further strengthen cooperation between jurisdictions on onshore gas supply, science and regulatory issues through collaborative action.

The Government has made a number of announcements recently to enhance gas supply security and affordability for Australian consumers. The Department has included information on these announcements and has also responded to your request for feedback on the three matters you discussed with the Minister for Resources and Northern Australia in late March 2017.

If you wish to discuss any elements of the submission, please contact [REDACTED], Manager, Onshore Gas Section on [REDACTED]

Yours sincerely



Glenys Beauchamp

4 July 2017



Australian Government

Department of Industry, Innovation
and Science

Submission to the Scientific Inquiry into
Hydraulic Fracturing in the Northern
Territory

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1. Introduction

Gas provides almost a fifth of Australia's total energy needs, and is a key input into electricity generation, manufacturing and the resources sector. Gas will continue to be an important source of energy in the long term to help maintain reliability of electricity supply, ensure Australian industrial, landholder and household power, plastics, chemicals and fertiliser needs are met and fulfil liquefied natural gas (LNG) export commitments. It is important for Australia to realise the benefits of natural gas, whilst preserving the environment for future generations. The Australian Government supports the responsible, regulated development of onshore gas.

The Northern Territory's (NT's) petroleum sector has grown steadily with the Darwin LNG project coming online in 2006 and the Ichthys project to be completed in 2017. While the NT currently has a relatively small domestic gas market, it has large growth potential once access to the east coast market is achieved through the completion of the Northern Gas Pipeline in 2018, which will link Tennant Creek to Mount Isa.

Since LNG exports commenced in 2015, the east coast LNG projects have substantially increased east coast gas demand. In 2017, if the three LNG projects in Queensland continue to increase output towards nameplate capacity, east coast consumption could exceed 2000 petajoules (PJ), a tripling of demand since 2015¹. The increase in demand, combined with some restrictive state government policies and a decline in drilling rates associated with low oil prices has placed pressure on security of supply for domestic users.

In March 2017, the Australian Energy Market Operator reported that without the development of new gas fields, the east coast could experience domestic gas shortfalls of between 10 PJ and 54 PJ per annum to 2024. This shortfall is more than four times Tasmania's annual consumption in 2016. The Australian Government has now acted to introduce LNG export controls and other measures agreed with industry, and continues to work collaboratively with states and territory governments through the COAG Energy Council to improve gas supply security. This situation presents a substantial market and economic growth opportunity for the Northern Territory, given its identified prospective resources of over 240 trillion cubic feet².

Notwithstanding these development opportunities, the imposition of moratoria and withdrawal of exploration licences by the NT government and other states is limiting Australia's new supply options. As evidenced by multiple reviews and inquiries, moratoria on unconventional gas development and organised community and non-governmental organisation campaigns, are impacting on the capacity for industry to develop new gas fields to meet Australia's needs. The Government is actively responding to community concerns about the risks and impacts of onshore gas development, and has implemented a range of initiatives to address them and ensure regulatory frameworks are sufficiently robust.

¹ Australian Energy Market Operator. National Gas Forecasting Report 2016: https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/NGFR/2016/2016-National-Gas-Forecasting-Report-NGFR-Final.pdf

² Northern Territory Government. Petroleum Opportunities, 2014: https://dpir.nt.gov.au/data/assets/pdf_file/0003/258915/2014_EnergyNT.pdf

The Department understands that hydraulic fracturing has been widely used in Australia within the geothermal and gas industries and has been used in most states (largely in South Australia and Queensland) for stimulation of petroleum wells. Fracture stimulation of coal seam gas (CSG) wells has taken place in Queensland and New South Wales. The need for hydraulic fracturing, and nature of an individual hydraulic fracture, depends on the geology, hydrodynamics and the nature of land use in surrounding areas.³ As identified in other State and Territory inquiries, hydraulic fracturing is unlikely to pose significant risks if properly managed and regulated.

When the Northern Territory government is ready to proceed, the Department, along with our portfolio agencies have a range of targeted work programs available to assist the Northern Territory to develop its gas resources sustainably, ensuring appropriate environmental protection, and in consultation with the community.

Section 2 of this submission provides specific feedback on matters Justice Pepper requested from the Minister for Resources and Northern Australia. Section 3 highlights the work of the Department and its portfolio agencies to promote a productive and sustainable unconventional gas sector. Section 4 responds to specific issues described in the Inquiry's Terms of Reference.

2. Response to matters raised in letter to the Minister for Resources and Northern Australia

On 4 May 2017, Justice Pepper wrote to the Senator the Hon Matthew Canavan, Minister for Resources and Northern Territory, to determine the Federal government's position in respect of the three matters below.

2.1 The fact that the water trigger contained in the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) ("the EPBC Act") does not appear to apply to the hydraulic fracturing of unconventional shale gas reservoirs, only to coal seam gas reservoirs.

The Department notes that shale or tight gas development projects would be subject to the EPBC Act if they are likely to have a significant impact on matters of national environmental significance, for example threatened species or ecological communities, including through impacts to water resources.

In 2013 the Commonwealth amended the EPBC Act to include water resources as a matter of national environmental significance when affected by coal mining or coal seam gas extraction.

The water trigger⁴ allows coal and coal seam gas developments that are likely to have a significant impact on water resources to be comprehensively assessed at a national level. As a result of the introduction of the water trigger, the Minister for the Environment and Energy can set appropriate conditions as part of the project approval to ensure that any impacts from these projects on a water resource are acceptable.

Recently, the operation of the water trigger legislation was reviewed. The outcomes of this review will be made available on the Department of the Environment and Energy's website⁵ in the coming months. The website includes an issues paper that outlines the terms of reference for the review.

³ <https://www.csiro.au/en/Research/Energy/Hydraulic-fracturing/a-What-is-hydraulic-fracturing>

⁴ <http://www.environment.gov.au/water/coal-and-coal-seam-gas>

⁵ <http://www.environment.gov.au/epbc/what-is-protected/water-resources/review>

2.2 The suggestion from some stakeholders (for example, the NT Cattleman's Association) that the relevant landholder (lessee or land owner) should be given a power of veto, that is to say, the power to refuse entry onto their land, effectively preventing any exploration for, or exploitation of, any unconventional shale gas resources.

Under the Constitution, ownership of minerals (including gas and petroleum) vests with the states. Ownership of minerals, gas and petroleum was conferred on the NT Government in the *Northern Territory (Self-Government) Act 1978*. While landholders cannot refuse access to holders of petroleum exploration or mining permits, licences or leases, state and territory governments have existing regulatory framework that require gas companies to enter into negotiated land access agreements with landholders to protect farmer's rights.

The COAG Energy Council's Multiple Land Use Framework⁶ helps to address challenges arising from competing land use, land access, land use change and sequential land use. The Framework provides guidance to jurisdictions in the development of their respective land access policies and legislation. The Framework is designed to operate within established regulatory and policy frameworks and while each jurisdiction is implementing the Framework in its own manner their regimes are broadly consistent with this Framework.

The Australian Government's *Agricultural Competitiveness White Paper*⁷ articulates the following principles for co-existence of farming and the development of unconventional gas resources:

- access to agricultural land should only be done with the farmer's agreement, and farmers should be fairly compensated
- there must be no long-term damage to water resources used for agriculture and local communities
- prime agricultural land and quality water resources must not be compromised for future generations.

The Department notes there are voluntary, additional land access arrangements in place in some jurisdictions (also see section 4.3). For example, the *Agreed Principles of Land Access* was signed initially in 2014 by gas companies Santos and AGL and landholder representatives NSW Farmers, Cotton Australia and the NSW Irrigators Council. In 2015⁸, the Country Women's Association and Dairy Farmers also signed the agreement. The agreed principles are:

- Any Landholder must be allowed to freely express their views on the type of drilling operations that should or should not take place on their land without criticism, pressure, harassment or intimidation. Any Landholder is at liberty to say "yes" or "no" to the conduct of operation on their land.
- Gas companies confirm that they will respect the Landholder's wishes and not enter onto a Landholder's property to conduct drilling operations where that Landholder has clearly expressed the view that operations on their property would be unwelcome.
- The parties will uphold the Landholder's decision to allow access for drilling operations and do not support attempts by third party groups to interfere with any agreed operations. The

⁶ Available at <http://www.coagenergycouncil.gov.au/publications/multiple-land-use-framework-december-2013>

⁷ Available at: <http://agwhitepaper.agriculture.gov.au/>

⁸ http://www.resourcesandenergy.nsw.gov.au/_data/assets/pdf_file/0009/577440/Two-new-signatories-to-the-agreed-principles-of-land-access.pdf

parties condemn bullying, harassment and intimidation in relation to agreed drilling operations.

The Department further notes that in 2015, the Senate Environment and Communications Legislation Committee recommended⁹ the Senate not pass the *Landholders' Right to Refuse (Gas and Coal) Bill 2015*. The bill sought to provide Australian landholders the right to refuse the undertaking of gas and coal mining activities on their land without prior written authorisation and to ban hydraulic fracturing.

The Committee further stated that:

“Any questions about the Commonwealth's and states' roles and responsibilities in these areas are most appropriately dealt with by the Council of Australian Governments (COAG), not by unilateral action undertaken by the Commonwealth. Although the primary responsibility for the regulation of unconventional gas rests with the states, the Australian Government can continue to show leadership via the COAG Energy Council and through Australian Government policies.”

As part of the Australian Government's 2017-18 Budget, it was announced that the Government will work with the state and territory governments, through the COAG Energy Council, to lead the development of a model land access agreement to assist landholders achieve a fair level of compensation and to reduce the time taken to negotiate land access agreements. This work will be put to COAG Energy Council members and is intended to be progressed as part of the COAG Energy Council's Gas Supply Strategy agenda. See section 3.4 for additional information.

It is important that benefits are realised by landholders and rural and regional communities from the extraction of unconventional gas. By working cooperatively with landholders, gas companies will create an environment that fosters the extraction of onshore gas, which will have benefits for the landholder and for the rural and regional communities where gas extraction occurs.

2.3 The suggestion that land holders (lessees or land owners) receive a share of any royalties generated from the exploitation of any unconventional shale gas resources located under their land.

Community and landowner acceptance and agreement to host onshore gas activity is essential for the timely development of onshore gas. The South Australian inquiry into Unconventional Gas (Fracking) in the South East of South Australia (2016), found that without community and landowner acceptance, gas developments should not proceed. To improve the benefit to landowners, the South Australian government introduced the 'PACE Royalties Return Scheme', a scheme that will provide ten per cent of royalties the South Australian government collects back to the landowners whose property overlies a new petroleum field that is brought into production.

As part of the Australian Government's 2017-18 Budget, it was announced that the Government will work with the state and territory governments, through the COAG Energy Council, to lead the development of a nationally consistent approach to schemes that direct a share of petroleum royalties to landholders. This work is intended to be progressed as part of the COAG Energy Council's Gas Supply Strategy agenda. See section 3.4 for additional information.

⁹ Senate report available at: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Gas_and_Coal/Report

3. Department and portfolio agency initiatives

3.1 COAG Energy Council: Gas Supply Strategy

In December 2015, the COAG Energy Council agreed to the Gas Supply Strategy (GSS). In August 2016, the GSS Implementation Plan for Collaborative Actions was approved by all jurisdictions except Victoria. The GSS sets out the Energy Council's commitment to improving collaborative efforts between jurisdictions on scientific and regulatory issues associated with onshore gas.

It identifies 14 actions under the following opportunities for collaboration:

1. improving information on gas reserves and production potential
2. improving public availability and accessibility of rigorous science and factual information
3. consideration of leading practice regulatory frameworks that effectively manage the risks and address issues for all conventional and unconventional gas resources
4. supporting leading practices in industry to support responsible development.

Individual jurisdictions determine their level of participation in gas market developments, however COAG Energy Council members have committed to share information and experiences regardless of individual government policy positions. In May 2017, Victoria advised that it will commence participating in the implementation of GSS collaborative actions relating to onshore conventional gas.

The GSS is being implemented over an 18 month period from August 2016 and the first progress report was noted by Ministers in December 2016. Importantly, the COAG Energy Council can agree to additional collaborative actions at any time. Further information on the implementation of the GSS can be found at www.coagenergycouncil.gov.au.

3.2 Gas Industry Social and Environmental Research Alliance

The Gas Industry Social and Environmental Research Alliance's (GISERA) research addresses potential social, economic and environmental challenges and opportunities of the gas industry. GISERA was launched in July 2011 with an initial focus on Queensland's coal seam gas to LNG industry.

GISERA industry partners initially invested more than \$15 million over the first five years to research¹⁰ the environmental, social and economic impacts of the natural gas industry. Based on the success of the research programs in Queensland, GISERA expanded its research into regional New South Wales (NSW) in 2016. This expansion has been funded through a combined \$3 million investment from the Australian and NSW Governments and an annual cash contribution of \$150,000 from each of the five industry members over 3 years. GISERA's governance framework allows for additional jurisdictions/parties to join the alliance in the future.

In 2016, the Australian Government committed an additional \$4 million dollars towards the national expansion of the GISERA. The Australian Government expects CSIRO, industry and state/territory governments to match this commitment. The current GISERA National Alliance agreement¹¹ acknowledges Origin's commitment to participating in Alliance Activities related to the NT. The Department encourages the Inquiry Taskforce to consider recommending to the NT government that

¹⁰ Information on current research projects is available at www.gisera.org.au.

¹¹ https://gisera.org.au/wp-content/uploads/2017/01/National-GISERA-Agreement_web-version.pdf

they support and co-invest in the expansion of GISERA into NT, to enable social and environmental impacts research to take place and address specific local concerns.

The CSIRO's submission to the Inquiry provides more information on GISERA's work.

3.3 Exploring for the future

While there are opportunities for significant commercial resource discovery in Australia, there is also fierce global competition to attract investment. The Australian Government's Domestic Gas Strategy identified the importance of pre-competitive geoscience information about our underexplored regions, and access to our national data sets. Improving information quality and access reduces exploration risks, thereby enhancing the attractiveness of Australia as an exploration and investment destination.

The Australian Government is providing \$100 million over four years for the Exploring for the Future programme to produce new pre-competitive geoscience information to help industry to better target areas likely to contain the next major gas resources (and oil and mineral deposits). The programme is being administered by Geoscience Australia and has a strong focus on the NT, and northern Australia more generally.

The acquisition of new pre-competitive geoscience data will de-risk private sector mineral exploration, and help to identify major new gas, minerals, and ground water resources. Exploring for the Future is expected to lead to new exploration investment, increase tenement uptake and improve the effectiveness of exploration drilling programmes¹².

Further detail on this program and other geoscience related initiatives is provided in Geoscience Australia's submission to the inquiry.

3.4 2017-18 Budget measures relating to gas

On 9 May 2017, the Treasurer announced the Australian Government will provide close to \$93 million over the next four years to increase gas production and support affordable energy prices¹³. This investment is on top of the reforms recently announced by the Prime Minister including the Australian Domestic Gas Security Mechanism¹⁴ and the Gas Supply Guarantee¹⁵.

The Department is responsible for implementing the \$28.7 million component of the package which supports the development of new onshore gas supply by:

- providing \$26 million over four years for a grant program, to states and territories to accelerate projects that can deliver gas to east coast gas consumers within three years.
- providing \$2.7 million to work with the state and territory governments, through the COAG Energy Council, to:
 - lead the development of a nationally consistent approach to schemes that direct a share of petroleum royalties to landholders
 - lead the development of a model land access agreement to assist landholders achieve a fair level of compensation and to reduce the time taken to negotiate land access agreements

¹² Further information about Exploring for the Future can be found at: <https://industry.gov.au/resource/Programs/Pages/Exploring-for-the-Future.aspx>.

¹³ See Budget Paper No.2, http://budget.gov.au/2017-18/content/bp2/download/bp2_expense.pdf

¹⁴ Prime Minister Media Release, 27 April 2017, <http://www.pm.gov.au/media/2017-04-27/delivering-affordable-gas-all-australians>

¹⁵ Prime Minister Media Release, 19 April 2017, <http://www.pm.gov.au/media/2017-04-19/gas-supply-0>

- develop a communication strategy to educate communities about the onshore gas industry.

The \$26 million grant program will be open to all jurisdictions. Grant program guidelines are currently being developed, however the Australian Government will fund up to 50 per cent of expenditure to a capped amount, likely to be up to \$6.5 million per project, and support will be given to projects that have the greatest likelihood of securing new and significant gas supplies to domestic customers by year-end 2020.

A nationally consistent approach to distributing royalties to landholders will ensure that farmers impacted by the onshore gas industry are fairly rewarded. While it is a State and Territory decision to implement a royalty sharing scheme as a result of this work, it is intended that these payments would be in addition to any payments from land access agreements negotiated with individual companies.

Landowners in regions with the strong potential for onshore gas development will be able to use the model land access agreement to help prepare for negotiations with onshore gas operators. The model land access agreement will create an important reference point, assisting landowners to have a clear understanding about the impact of activity on their land and the fair level of compensation they should receive, including monetary and non-monetary benefits.

State and territory inquiries into the onshore gas industry (including fracking) have found that misinformation is a key reason why some community and landholders are opposed to onshore gas. In areas where the industry is new, inquiry committees have reported strong support from the community for the provision of factual information. The communication strategy work is intended to help improve the availability of factual information and scientific research.

Further information about these initiatives will be made available in the coming months.

3.5 Australian Domestic Gas Security Mechanism

On 27 April 2017, the Government released its framework for an Australian Domestic Gas Security Mechanism (ADGSM), an LNG export licensing system to ensure there is a secure and adequate supply of gas available to meet Australian domestic gas market needs. The mechanism is critical to the Government's plan to ensure a sufficient supply of gas to Australian homes and businesses.

The ADGSM, which is a targeted and temporary measure of last resort, will operate alongside crucial new reform measures, including the Australian Competition and Consumer Commission's gas market transparency work, the Peak Supply Guarantee and other market and resource development actions.

Any restrictions or offset requirements will only be placed on export operations that are, in effect, drawing more supply from the domestic market than they put in. The mechanism will give affected LNG companies the flexibility to find commercial solutions to their domestic market responsibilities. It is being designed to minimise compliance costs, and work alongside Australia's international trade obligations and agreements.

The Government acknowledges that export controls are not the solution to all of Australia's current market issues. In the long term, releasing additional gas to the market is the only realistic way to improve gas reliability and affordability for Australian consumers. This is why the Government supports the responsible, regulated development of onshore gas. The Government remains committed to accelerating current market reforms, and will continue to work with industry, and state governments to promote the development of Australia's enormous gas reserves.

By preventing an export driven shortfall, the ADGSM will protect Australian jobs, and increase the competitiveness of Australian businesses that rely on gas. These complementary actions will reduce the risk of Australians paying above international parity level prices. The Australian Government believes that this approach appropriately balances our domestic gas market security obligations, our international trade commitments and our support for Australia's valuable wealth-creating LNG industry.

4. Response to the Terms of Reference

4.1 Environmental impacts from unconventional gas projects

The Australian Government considers that the potential environmental risks and social impacts associated with the unconventional gas industry can be responsibly and effectively managed through existing jurisdictional statutory and policy frameworks.

Government policies reflect the co-operation between the Australian, state and territory governments in ensuring the safe and responsible development of the unconventional gas industry. Existing jurisdictional statutory and policy frameworks ensure that development of the industry can occur consistent with community expectations and environmental protection. Australian, state and territory governments continue to invest in gathering robust scientific information for policy development and decision making. Within this framework the role of industry in adhering to best-practice is critical.

The Australian Government recognises that regulation and policy development has matured in response to the development and expansion of the unconventional gas industry. There is satisfactory evidence from scientific studies and historical reviews of CSG activities to enable effective regulation, as well as preparing for the establishment of an Australian shale and tight gas industry.

The Department of the Environment and Energy is leading the Australian Government's efforts to improve our understanding of the water-related impacts from CSG and large coal mining development. This includes programmes of targeted bioregional assessments and research.

Bioregional Assessment Program

Bioregional assessments are science-based studies that improve our understanding of impacts on water resources from CSG and large coal mining across 13 regions in New South Wales, Queensland, South Australia, and Victoria. They assess where potential cumulative impacts on water are likely to occur and, importantly, where impacts are not likely to occur. To assess cumulative impacts, the bioregional assessments compare existing water use in the region (the 'baseline') to the additional coal and CSG developments post-2012. The findings are generally at a regional level and will allow governments, industry and the community to focus on areas that are likely to be impacted by coal and CSG development, resulting in improved regulatory, water management and planning decisions.

The program is based on an internationally peer-reviewed innovative methodology. Almost all assessment products, methods, maps, models and more than 1,400 datasets will be publicly available on an information platform. This will allow natural resource managers, community members, government, industry and other interested parties to easily access information, while making the process more transparent to the public.

Combined geological and bioregional resource assessments are independent scientific studies into the potential impacts on water and the environment from unconventional gas. The objective is to encourage exploration and bring new shale and tight gas resources to the east coast gas market within five to ten years. Independent scientific assessments during the exploration phase for shale and tight gas resources will help to build community understanding of the industry and provide regulators and industry a common information base to inform decision-making.

The assessments led by the Department of the Environment and Energy in collaboration with Geoscience Australia and CSIRO will generate a suite of publicly available pre-competitive geological and environmental data and information and planning tools. This will provide advance notice of shale and tight gas prospectivity and the potential environmental impacts of their extraction on water resources.

Other Research

In addition to the bioregional assessments, the Department of the Environment and Energy has commissioned scientific research in priority themes to better understand the impacts of CSG and large coal mining development on water resources. The research can also provide significant benefits in understanding the potential impacts from a shale and tight gas industry. The research aims to strengthen the science underpinning regulatory decisions. The research includes:

- Hydrology: addressing knowledge gaps in inter-aquifer connectivity, bore integrity, subsidence and groundwater modelling;
- Ecosystems and water: improving scientific understanding of the ecological impacts caused by changes to water quantity, quality, and flow; and informing the ability to monitor and mitigate the effects of coal seam gas and coal mining on aquatic ecosystems, key species and ecological communities;
- Chemicals: water-related risks to environmental health; improving scientific understanding of chemicals used in drilling and hydraulic fracturing, their movement in surface and groundwater systems, and their toxicity; and informing decisions about the management of salts and heavy metals; and
- Cumulative impacts: a cross-cutting issue informed by ongoing work on the priority themes and through the bioregional assessments.

Other Inquiries and Reviews

A number of inquiries and reviews have been completed to inform jurisdictional policy and regulatory regimes in relation to unconventional gas development and the use of hydraulic fracturing.

This non-exhaustive list of work suggests that environmental risks of hydraulic fracturing are manageable when strong regulatory frameworks in place.

- In 2012, the UK peer reviewed Royal Society and the Royal Academy of Engineering's report found "that the health and safety and environmental risks associated with hydraulic fracturing as a means to extract shale gas can be managed in the UK as long as operational best practices are implemented and enforced through regulation. Hydraulic fracturing is an established technology that has been used for many decades"¹⁶.

¹⁶ The Royal Society and the Royal Academy of Engineering (2012). *Shale gas extraction in the UK: a review of hydraulic fracturing*. Available at: <http://www.raeng.org.uk/publications/reports/shale-gas-extraction-in-the-uk>

- In September 2014, the NSW Chief Scientist & Engineer published the *Final Report of the Independent Review of Coal Seam Gas Activities in NSW*¹⁷. The report found that “the technical challenges and risks posed by the CSG industry can in general be managed through careful designation of areas appropriate for CSG extraction; high standards of engineering and professionalism in CSG companies; creation of a State-Whole-of-Environment Data Repository; comprehensive monitoring of CSG operations with ongoing scrutiny of collected data, a well-trained and certified workforce; and applying new technologies as they become available”. The review also noted that Australia has developed significant water management capabilities through research carried out by national science institutions, such as CSIRO and the Bureau of Meteorology¹⁸.
- In September 2015 the Australian Academy of Technological Sciences and Engineering (ATSE) held conference covering both technical and social issues related to unconventional gas development. Conferences such as this contribute to the ongoing, science based, discussion on the future of Australia’s unconventional gas industry.
- In November 2015, the *Western Australian Senate Inquiry into Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas* found the likelihood of hydraulic fracturing intersecting underground aquifers to be “negligible”. It also found that “the risk of water contamination as a result of fugitive methane during hydraulic fracturing in Western Australia (WA) is highly unlikely and can be minimised through baseline monitoring of water quality and ongoing monitoring”. With respect to impacts from chemicals, the WA inquiry similarly found that “the risk of spills of chemicals or other fluids associated with hydraulic fracturing can be effectively managed”¹⁹.
- In November 2016, the *Inquiry into Unconventional Gas (Fracking) in the South East of South Australia* found, the specific process of hydraulic fracturing or “fracking” in deep shale, properly managed and regulated, is unlikely to pose significant risks to groundwater, but other processes associated with unconventional gas extraction, including mid to long-term well bore integrity, surface spills, and waste and chemical transport, present risks that need to be properly considered and managed”²⁰.

4.2 Aboriginal people and their culture

In the NT, the Commonwealth’s *Aboriginal Land Rights (Northern Territory) Act 1976* (Land Rights Act) provides for grants of Aboriginal land including the claiming of unalienated crown land and certain other land by those groups that can prove through a claims process, before an Aboriginal Land Commissioner, that they are the traditional Aboriginal owners. Half the NT is now Aboriginal land. The Land Rights Act establishes Land Councils, which are independently funded from the Aboriginals Benefit Account by mining royalty equivalents²¹. In relation to exploration and mining on Aboriginal land, traditional owners have a right of consent to exploration. The Land Councils support

¹⁷ New South Wales Government (2014). *Final Report of the Independent Review of Coal Seam Gas Activities in NSW*. Available at: http://www.chiefscientist.nsw.gov.au/_data/assets/pdf_file/0005/56912/140930-CSG-Final-Report.pdf

¹⁸ New South Wales Government (2014). *Coal Seam Gas Review*. Available at: <http://www.chiefscientist.nsw.gov.au/reports/coal-seam-gas-review>

¹⁹ Government of Western Australia (2015). *Implications for Western Australia of Hydraulic Fracturing for Unconventional Gas*. Available at: http://dmp.wa.gov.au/Documents/Petroleum/Report42-HydraulicFracturing_UnconventionalGas.pdf

²⁰ Parliament of South Australia (2016). *Inquiry into Unconventional Gas (Fracking) in the South East of South Australia*. Available at: <https://www.parliament.sa.gov.au/Committees/Pages/Committees.aspx?CTId=5&Cid=175>

²¹ The majority of NT Land Council funding comes from this mechanism, which covers all their Land Rights Act functions. A minority of funding for non-Land Rights Act functions comes from other sources (e.g. normal budget funding via the Indigenous Advancement Strategy for Indigenous Ranger functions and for Native Title Representative Body functions for two of the Land Councils).

traditional owners to negotiate beneficial mining agreements that include valuable business and employment opportunities for their communities.

In December 2015, the COAG Investigation into Indigenous Land Administration and Use recommended the Commonwealth Government work with the NT Government, NT Land Councils and industry to assess whether the exploration and mining provisions in the Land Rights Act can operate more effectively and efficiently. In October 2016, the Northern Territory Biannual Strategic Forum agreed that a Working Group consisting of the Commonwealth, the NT Government and Land Councils would be established to develop an agreed package of reforms to be made in this term of government. The Working Group met in March 2017 and reported to the May 2017 Biannual Strategic Forum, which agreed to consult with peak industry bodies.

4.3 Impacts on landholders

As noted in section 2.2, the *Agricultural Competitiveness White Paper* articulates the Australian Government's principles for co-existence of farming and the development of unconventional gas resources.

Experience in Australia, especially in Queensland, has demonstrated that regulatory frameworks can support co-existence with other land uses while affording high levels of protection to the community, workers and the environment. The COAG Energy Council is working to improve community engagement and community acceptance research through sharing communications tools and resources that have proven to be successful. This work includes the publication of a number of case studies demonstrating examples of good practice community engagement and collaboration with the CSIRO on community engagement and acceptance research.

In NSW and WA, the gas industry has broad agreements with peak bodies representing landholders. The agreements formalise a commitment that landholders will be treated fairly, with the NSW *Agreed Principles of Land Access* giving landholders the right to say no to any activity on their land²². WA has the *Farming Land Access Agreement Template* and accompanying documents, which focus on building a mutually beneficial relationship, without granting landholders the right of veto²³.

The Government firmly believes that landholders should be fairly compensated by gas producers operating on their land. Current practices in Queensland involve compensation as part of land access agreements, but exact dollar values are commercial in confidence. As part of its public consultation, Santos has released indicative compensation for landholders if the Narrabri project proceeds²⁴. Santos estimated that:

- in the “exploration and appraisal phase”, landholders could be paid upwards of \$30,000
- in the “production phase” (typically 20 to 30 years), a landholder with two to three production wells could receive \$30,000 in the first year, and \$50,000 each year thereafter.

²² http://www.resourcesandenergy.nsw.gov.au/_data/assets/pdf_file/0009/577440/Two-new-signatories-to-the-agreed-principles-of-land-access.pdf

²³ https://www.appea.com.au/media_release/oil-and-gas-and-farming-industries-endorse-new-framework-for-coexistence-in-western-australia/

²⁴ https://narrabrigasproject.com.au/uploads/2014/08/Fact_sheet-Working_with_landholders_web.pdf

In 2017, the South Australian Government announced a royalty sharing programme for landowners, PACE Royalty Return²⁵. As described in section 3.4, the Australian Government will be leading work through the COAG Energy Council on a model land access agreement and nationally consistent royalty sharing regimes.

The Department notes that landholders can approach the GasFields Commission Queensland²⁶ and New South Wales Land and Water Commissioner²⁷ for advice and assistance.

4.4 Socio-economic impacts

The Office of the Chief Economist conducted the 2015 *Review of the socioeconomic impact of coal seam gas in Queensland*²⁸ which assessed existing socioeconomic research. The review found that the headline economic impacts of CSG development in Queensland have been net positive, including increases in employment, income, consumption and government revenue.

For example, during the construction phase, the growth of the unconventional gas industry has created both direct and indirect jobs, particularly in the construction and professional services sectors.²⁹ The unemployment rate in the Surat Basin decreased from 5.9 to 3.1 per cent between 2001 and 2011, and in the Bowen Basin from 4.3 to 2.2 per cent.³⁰ Over the same period, family income grew by 12 to 15 per cent in areas where CSG development was occurring compared to the rest of Queensland.³¹ Business income in certain towns showed a five-fold increase in one year.³²

In 2012–13, direct value added from the CSG sector (including salaries to direct full-time employees, purchases of goods and services and community contributions) was \$13.3 billion, and second round value added (supply chain and consumption effects) was \$9.5 billion.³³

The economic importance of the resources industry to Australia has been recognised in establishment of the Australian Government's Oil, Gas and Energy Resources Growth Centre, National Energy Resources Australia (NERA)^[1] and the Industry Growth Centre for the mining equipment, technology and services sector, METS Ignited.^[2] The Australian Government is providing over \$33 million (GST inclusive) over four years to each of the Growth Centres.

NERA is working with the oil, gas, coal and uranium sectors, its related services industry and researchers to increase and enhance the global competitiveness, collaboration and productivity of the sector. NERA's ten-year Sector Competitiveness Plan envisages an Australian energy resources sector which is globally competitive, growing, sustainable, innovative and diverse. Focus areas identified in the NERA sector plan include: managing cost structures and improving productivity;

²⁵

http://petroleum.statedevelopment.sa.gov.au/data_and_publications/mesa_journal/news/pace_contributing_to_the_south_australian_energy_plan

²⁶ <http://www.gasfieldscommissionqld.org.au/gasfields>

²⁷ <http://www.industry.nsw.gov.au/about/our-business/statutory-officers-and-independent-appointments/land-and-water-commissioner>

²⁸ Australian Government: Office of the Chief Economist (2015). *Review of the socioeconomic impacts of coal seam gas in Queensland*. Available at: <http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/coal-seam-gas/Socioeconomic-impacts-of-coal-seam-gas-in-Queensland.pdf>

²⁹ Fleming, D.A. and Measham, T.G. (2015). *Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia*. *The Australian Journal of Agricultural and Resource Economics* 59, 78-94.

³⁰ Queensland Government: Statistician's Office (2015). *Queensland Regional Profiles*. Available at: <http://statistics.qgso.qld.gov.au/qld-regional-profiles>

³¹ Fleming, D.A. and Measham, T.G. (2015). *Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia*. *The Australian Journal of Agricultural and Resource Economics* 59, 78-94.

³² Katherine Witt, University of Queensland, personal communication (based on analysis of ATO data).

³³ Queensland Resources Council (2014). *Economic report*. Available at: https://www.qrc.org.au/01_cms/details.asp?ID=3473

[1] National Energy Resources Australia: <http://www.nera.org.au/>

[2] METS Ignited: <http://www.metsignited.org/>

enhancing collaboration - across operators, along the value chain and between industry and researchers; and promoting industry sustainability through identifying and supporting leading practice in stakeholder engagement, with a greater understanding of the social, environmental, economic and operational consequences of industry activity and by supporting trusted, inclusive custodians of scientific data.

METS Ignited is working with Australian suppliers to the mining and resources industry, global miners, and research organisations to enhance the global competitiveness of the Australian mining equipment, technology and services industry. METS Ignited's ten-year Sector Competitiveness Plan envisages an Australian METS sector having an aligned, efficient and agile industry ecosystem with a high degree of collaboration, global leadership in innovation, and a growing share of the global market. Focus areas identified in the METS sector plan include: aligning the strategies of METS, miners and research institutions, ensuring innovation is characterised by customer-pull rather than product-push; developing a stronger identify and clear brand and value proposition for the Australian METS sector; and accelerating the participation of the Australian METS sector in domestic and global supply chains by fostering clustering and collaboration and by increasing capital markets engagement.

The GISERA is also undertaking a range of social and economic impacts research across Queensland and New South Wales. Information about the following projects is available on the GISERA website³⁴:

- Social baseline assessment of the Narrabri region of NSW in relation to CSG development
- Analysing economic and demographic trajectories in NSW regions experiencing CSG development and operations
- Community functioning and wellbeing
- Understanding community aspirations
- Monitoring regional transition
- Economic assessment and forecasting
- Decommissioning pathways for CSG projects.

4.5 Regulatory framework

The Australian, state and territory governments have a shared responsibility to ensure the safe and responsible development of unconventional gas resources and to maximise benefits for the Australian community. State and territory governments have principal responsibility for unconventional gas development, but the Australian Government plays an important leadership role in providing appropriate policy settings and regulation. This includes the protection of matters of national environmental significance through the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and work through the COAG Energy Council to identify strategies for deeper collaboration with the states and territories through implementation of the *Gas Supply Strategy*. Details of how these initiatives support this national approach are provided below.

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the principal piece of legislation that allows the Australian Government to join with the states and territories to provide a national framework for the protection of our biodiversity.

The EPBC Act focuses on the protection of matters of national environmental significance, while state and territory legislation focuses on matters of state and local significance. In 2013, the EPBC

³⁴ <https://gisera.org.au/research/social-and-economic-impacts-and-opportunities/>

Act was amended to include water resources as a matter of national environmental significance when affected by CSG and large coal mining development (the ‘water trigger’).

Under the EPBC Act, the Minister for the Environment and Energy may accredit the assessment processes of a state or territory, thereby removing unnecessary duplication and red tape. Under an assessment bilateral agreement, the relevant state or territory government regulator is responsible for undertaking the statutory assessment process for proposed developments on behalf of the Australian Government regulator. The Australian and relevant state or territory government regulators then make separate decisions on the approval of the development.

Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC)

The IESC provides scientific advice to decision makers on the impact that CSG and large coal mining development may have on Australia’s water resources.

The IESC was established as a statutory committee in 2012 by the Australian Government under the EPBC Act in response to community concerns. An Interim IESC operated between January and November 2012. IESC members possess strong scientific qualifications and expertise in the fields of hydrogeology, hydrology, ecology, geology, ecotoxicology, natural resource management and environment protection.

The IESC provides independent, expert scientific advice on CSG and large coal mining proposals as requested by the Australian Government and National Partnership Agreement on Coal Seam Gas and Large Coal Mining Development signatory state government regulators (New South Wales, Queensland, South Australia and Victoria). This enables these regulators to have access to the best available science regarding potential water related impacts associated with those developments. All IESC advice is published on its website.

COAG Energy Council Gas Supply Strategy (GSS)

The GSS specifically identifies two collaborative actions for work on leading practice regulatory frameworks to effectively manage the risks and address issues for conventional and unconventional gas resources:

- Review of the National Harmonised Regulatory Framework for Natural Gas from Coal Seams (NHRF) to reflect new scientific knowledge in 2017. First released in 2013, the COAG Energy Council’s NHRF³⁵ identifies leading practices to provide a robust basis for the development and refinement of legislation, regulations, policies and practices. The NHRF encourages the implementation of streamlined, transparent and consistent processes in which activities are regulated in accordance with the level of risk.
- Development of a position paper by the Upstream Petroleum Resources (UPR) working group to seek national alignment of objectives for the regulation of shale and tight gas developments. The Department notes that the Energy Council approved the *Key Principles for the National Harmonised Regulatory Framework for Petroleum* in December 2016 and work is underway on the proposed metrics to facilitate regular reporting to the Energy Council.

³⁵ Standing Council on Energy and Resources (2013). *National Harmonised Regulatory Framework for Natural Gas from Coal Seams*. Available at: http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/National-Harmonised-Regulatory-Framework-for-Natural-Gas-from-Coal-Seams_1.pdf