

# SCIENTIFIC INQUIRY INTO HYDRAULIC FRACTURING IN THE NORTHERN TERRITORY



Department of Primary  
Industry and Resources  
Submission #424

Mr Alister Trier  
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Email: [REDACTED]

Dear Mr Trier

## RE: HYDRAULIC FRACTURING INQUIRY – INFORMATION REQUEST

I refer to the *Scientific Inquiry into Hydraulic Fracturing of Unconventional Reservoirs in the Northern Territory (the Inquiry)*, which was established by the Northern Territory Government under the *Inquiries Act 1945 (NT)* in late 2016 to investigate the impacts and risks of hydraulic fracturing of onshore shale gas reservoirs and associated activities on the environmental, social, economic and cultural conditions in the Northern Territory.

The Inquiry has identified a number of issues requiring further input from the Department of Primary Industry and Resources (**DPIR**). Pursuant to s 9 of the *Inquiries Act 1945 (NT)*, I request that you provide a response to each of the matters outlined below.

### 1. Well integrity

In their submission, Lock the Gate quote from the submission that the International Association of Hydrogeologists made to Dr Hawke's 2014 Inquiry into hydraulic fracturing in the Northern Territory:

*“Well integrity is of concern in the NT because some groundwater environments in the NT are naturally corrosive. An example of the effect of corrosive water on cementing and casing in the NT is provided by deep oil exploration wells (McDills and Dakota) drilled in the Perdika/Great Artesian Basin in the 1960s. (The Perdika Basin is one of the prospective unconventional shale gas areas of the NT). Now, some fifty years later, the steel casing has almost entirely corroded away, resulting in inter---aquifer contamination. This well required expensive rehabilitation works to stem artesian flow (Humphreys and Kunde, 2004). This single bore cost the Territory and Commonwealth Governments \$500,000 to plug as the company responsible for the well was insolvent. This example highlights the issue of operator insolvency due to the boom and bust cycles of oil and gas development*

*which complicate efforts to hold liable parties responsible and provide for timely environmental reclamation.”<sup>1</sup>*

Please comment on the above statement and include a discussion about the impact that the use of modern well design and construction practices has on long term well integrity.

Please also comment on how, under the current regulatory framework, the costs associated with remedying any environmental damage associated with the possible failure of an abandoned well are distributed between the taxpayer and the interest holder in the following scenarios:

- if the interest holder becomes insolvent while it holds the relevant petroleum interest;
- if the interest holder transfers the tenement to another entity; or
- if the interest holder surrenders the tenement or the tenement is cancelled.

Please identify any regulatory or other reforms that should be made to increase the transparency and accountability of the current system and, in addition, to the extent the taxpayer may be liable for any residual remediation costs under the current system, how this can be avoided.

## **2. Flowback and produced water**

The Interim Report includes a discussion on the composition of flowback and produced water.<sup>2</sup> As noted in the Report, these waters may contain geogenic chemicals from the shale formation that are of potential environmental significance. These chemicals will be in addition to those that were originally found in hydraulic fracturing fluid.

Interest holders are currently required to disclose the chemicals used in hydraulic fracturing fluids to DPIR.<sup>3</sup> However, the identity and concentration of chemicals in formation and produced water do not presently need to be disclosed.

The Inquiry’s preliminary view is that the regulatory framework should include a requirement that:

- (a) a risk assessment of the chemical composition of flowback and produced water be undertaken; and
- (b) real time disclosure of the chemical composition of flowback and produced water should be required.

Please comment on these views.

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<sup>1</sup> Lock the Gate, submission 171, page 24.

<sup>2</sup> Interim Report, chapter 5.5.3, page 29 and 7.4.2, page 54.

<sup>3</sup> *Schedule of Onshore Petroleum Exploration and Production Requirements 2016*, cl 342(4).

### **3. Solid waste management**

As noted in the Interim Report, the solids produced by drilling represent a substantial waste stream associated with the production of onshore shale gas.<sup>4</sup> In the United States, the disposal of large amounts of drill cuttings produced by a full-scale industry is the cause of considerable concern given the nature of this material and its potential to leach organic and inorganic components into the near surface environment.

A strategic management issue for any potential shale gas industry in the Northern Territory will be the question of whether solid waste should be contained in a purpose-built and engineered centralised facility, or contained and managed on site, as is currently the case for the exploration regime.

Please indicate DPIR's current position on this issue.

### **4. Infrastructure requirements**

DPIR has estimated the number of wells that would be required for a full scale industry.<sup>5</sup> These estimates appear to be different to the estimates provided by industry, which propose around 150 drilling pads and 1000 wells.<sup>6</sup>

Please comment on the differences between the estimates provided by industry and describe how DPIR arrived at its estimates.

Please also provide details on the expected:

- initial size of well-pads;
- size of well-pads during the operation phase;
- length and clearing width for collector pipelines; and
- lengths and clearing widths of any access roads and other required easements that are not contained within pipeline corridors.

Please also comment on how the Department proposes to minimise the surface footprint of development.

### **5. Disposal of wastewater into aquifers**

The *Schedule of Onshore Petroleum Exploration and Production Requirements 2016* provides that an interest holder must take reasonable steps to “prevent... the pollution of aquifers”.<sup>7</sup> There does not, however, appear to be an express prohibition on the injection of wastewater, treated or not, into aquifers.

While the Inquiry's preliminary view is that the injection of wastewater, whether treated or untreated, into aquifers should not be permitted,<sup>8</sup> it is seeking additional information regarding the risks associated with this process and whether these risks can be managed.

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<sup>4</sup> Interim Report, Chapter 5.7, page 31.

<sup>5</sup> Department of Primary Industry and Resources, submission 226, page 51.

<sup>6</sup> Interim Report, page 43.

<sup>7</sup> Clause 325.

<sup>8</sup> Interim Report, page 57.

Please comment on this issue and identify any circumstances where, in DPIR's view, it would be considered appropriate to inject wastewater into an aquifer.

## **6. Storage**

Origin and Santos propose to minimise the risk of containment overtopping by designing to 1 in 100 year rainfall events. Lock the Gate, however, provided an example of a storage pond that overflowed during a recent wet season.<sup>9</sup> This suggests that it may be more appropriate to design for a maximum probable precipitation event coupled with an appropriate maximum operating level.

Please comment on leading practice mechanisms available to avoid containment overtopping, including the use of special purpose above ground tanks to store wastewater.<sup>10</sup>

## **7. Discharge into waterways**

DPIR has advised the Inquiry that:

*“Current practice requires that wastewater from hydraulic fracturing activities is fully contained on site.”<sup>11</sup>*

Please advise whether this requirement is prescribed in the legislation and how it is enforced. Please also advise whether there is an express prohibition on the release of untreated wastewater into waterways or drainage lines.

## **8. Amungee well data**

Following recent media coverage,<sup>12</sup> the Inquiry understands that certain monitoring information regarding the Amungee NW-1 well is passed on to DPIR on a weekly basis. Please provide the Inquiry with a copy of that data, including an interpretation of that data.

## **9. Greenhouse gas emissions**

The Panel has formed a preliminary view that, if the industry is given approval to proceed, the following mechanisms will be required to minimise greenhouse gas emissions, and in particular, methane emissions:

- implementation of leading practice standards for emission reduction (such as, for example, the United States Environmental Protection Agency's New Source Performance Standards, Permitting Rules for the Oil and Natural Gas Industry);
- baseline measurements of methane levels prior to development; and
- ongoing monitoring of methane levels at key points during exploration, development, and production.

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<sup>9</sup> Lock the Gate, submission 171, page 17.

<sup>10</sup> Interim Report, page 30.

<sup>11</sup> DPIR letter dated 30 May 2017, page 5.

<sup>12</sup> <http://www.abc.net.au/news/rural/2017-07-26/origin-amungee-fracking-well-bare-moratorium-nt/8741012> (last accessed 27 June 2017).

The Inquiry invites comments on the above. In addition, please comment on:

1. the technologies that are currently available to obtain baseline measurements of emissions, including the possible use of drones;
2. the scope, including the location, of any emissions monitoring that should occur during the exploration, development and production phases, such as, for example, wellheads during completion, liquids unloading, compressor seals and gathering stations;
3. the use of emission limits that, if exceeded, would trigger an investigation, make-good requirements and/or a penalty;
4. the need for transparency when setting emission limits; and
5. whether or not baseline measurements and on-going monitoring should be undertaken by an independent body.

The Inquiry also requests DPIR's comments on section 9.8 of the Interim Report, which has been duplicated at **Attachment A**.

### **10. Minimum standards**

In the Interim Report the Inquiry committed to explore:

*“mechanisms to ensure that minimum standards for environmental protection are guaranteed in the regulator framework, such as the requirement to undertake baseline studies prior to hydraulic fracturing”.*<sup>13</sup>

Please indicate whether DPIR supports the use of prescribed minimum standards in the regulatory framework and, if so, how minimum standards should be incorporated into the current statutory framework. Specifically, is it proposed that the *Petroleum (Environment) Regulations 2016* (NT) be amended to include minimum standards, or is it proposed that guidelines or other regulatory tools, such as Ministerial directions, be used?

### **11. Regulatory capture**

The Interim Report made the following observation:

*“The Panel noted the widely held view in the community that the DPIR is not independent from the industry. Some submissions noted that there was evidence of regulatory capture.”*

Please comment on this statement and describe any regulatory or structural reforms that DPIR has considered to ensure the independence of the regulator.

### **12. Cost recovery**

Please indicate whether DPIR has considered implementing a cost recovery system under the *Petroleum Act 1984* (NT). Please note the benefits associated with such a proposal.

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<sup>13</sup> Interim Report, page 125.

### **13. Compensation**

Please describe how the *Petroleum Act 1984* (NT) compensates traditional owners and pastoral lessees in the event a gas company causes damage to land, property or business operations.

### **14. Strategic development**

The Inquiry has received submissions to the effect that landholders, regional communities and the industry regulator in Queensland were not prepared for the fast and intense development of the coal seam gas industry in that State.

Since the “invasion” (as some stakeholders have described it) of the coal seam gas industry in Queensland in 2010, the Queensland government has, among other things:

- introduced and subsequently updated a Land Access Code under the *Mineral and Energy Resources (Common Provisions) Act 2014* (Qld);<sup>14</sup>
- established the GasFields Commission Queensland as an independent statutory body to, among other things, facilitate better relationships between landholders, regional communities and the onshore gas industry;<sup>15</sup>
- introduced a Bill for the establishment of a Land Access Ombudsman, which is intended to be an independent body to help landholders and gas companies resolved alleged breached of land access agreements;<sup>16</sup>
- established the Office of Groundwater Impact Assessment, which is an independent statutory body to support the management of groundwater impacts from petroleum and gas development;<sup>17</sup> and
- developed a Gas Action Plan, which the Inquiry understands will be released shortly.<sup>18</sup>

The mechanisms listed above were introduced after development of the industry commenced. The Inquiry has received submissions that the coal seam gas industry may have been in a better position to earn and maintain a social licence to operate had some, or all, of the measures listed above been in place prior to the coal seam gas “boom”.

The Inquiry seeks DPIR’s comment on this statement. Please describe any measures, including the measures adopted in Queensland, or in any other jurisdiction (whether subject to a moratorium on hydraulic fracturing or not, and including overseas jurisdictions, for example, Alberta, Canada), that DPIR

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<sup>14</sup> See [https://www.dnrm.qld.gov.au/\\_data/assets/pdf\\_file/0004/442633/land-access-code-2016.pdf](https://www.dnrm.qld.gov.au/_data/assets/pdf_file/0004/442633/land-access-code-2016.pdf) (last accessed 26 July 2017).

<sup>15</sup> See <http://www.gasfieldscommissionqld.org.au/about-us/> (last accessed 26 July 2017).

<sup>16</sup> See <https://www.dnrm.qld.gov.au/our-department/corporate-information/policies-initiatives/land-and-property-initiatives/land-access-ombudsman> (last accessed 26 July 2017).

<sup>17</sup> See <https://www.dnrm.qld.gov.au/ogia/role> (last accessed 26 July 2017).

<sup>18</sup> See <https://www.dnrm.qld.gov.au/our-department/corporate-information/policies-initiatives/mining-resources/gas-supply-demand-action-plan> (last accessed 26 July 2017).

considerers may restore the community's trust in the regulator and provide a foundation upon which the industry can earn a social licence.

Finally, please describe the mechanisms that are available under the current regulatory framework to ensure the strategic development of the shale gas industry. Specifically, please advise whether the current regulatory framework can accommodate the consecutive or staged (as opposed to concurrent) development of shale gas reservoirs.

Please identify any reference materials that the Inquiry should consider that are not referenced in the Interim Report.

Please also note that your response will be published on the Inquiry's submission library. To the extent your submission includes confidential information that should not be publicly disclosed, please identify that information and explain why it is confidential.

In order to meet current reporting timeframes, please provide a response to the matters raised in this letter no later than **15 August 2017**.

Yours sincerely

A handwritten signature in black ink, consisting of several overlapping, sweeping strokes that form a cursive, somewhat abstract shape.

THE HON JUSTICE RACHEL PEPPER  
Chair

1 August 2017

## Attachment A

### 9.8 Preliminary Assessment

#### Risk assessment

While carbon dioxide emissions dominate the life cycle GHG emissions (because downstream combustion of natural gas generates high amounts of carbon dioxide), methane emissions dominate the upstream GHG emissions. Furthermore, the quantity of methane emissions is more uncertain and they are more amenable to reduction. Accordingly, the focus of the proposed risk assessment is on methane emissions. A framework for an interim risk assessment is given in Table 9.2 for a number of hazards which may prevent lower levels of methane emission performance from being achieved. These levels of methane have been discussed previously.

At this stage, the Panel has insufficient information to make an informed assessment of risk. This risk assessment will be used to identify areas where mitigation of risks is required and to assess strategies to mitigate those risks.

Table 9.2: Interim risk assessment framework for hazards that may prevent lower levels of methane emission performance from being achieved

Hazard	Comments	Likelihood	Consequences	Risk
Regulations are not implemented at either State or Federal level.	Regulations are required for reduced emissions completions, compressor emissions and pneumatic controllers			
Regulations are not fully complied with	This may have the effect of allowing increased emissions			
Monitoring of regulatory compliance is not undertaken or is inadequate	Monitoring by a regulatory authority may not occur because of lack of resources.			
Monitoring of both baseline emissions and emissions during production is not undertaken	Monitoring emissions is one means for assuring compliance and also to possibly detect "super emitters"			
Low production performance means emission performance is not achieved	Wells that have low ultimate gas recovery can give rise to higher emission rates. Such wells may also be uneconomical			
Failure of plant or equipment occurs during the lifetime of the well	Consequences can range from a minor to a catastrophic release of gas for a relatively short period over the life of a well			