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23 August 2017

The Hon Justice Rachel Pepper
Chair

Scientific Inquiry into Hydraulic Fracturing of Onshore Unconventional Reservoirs in the NT
GPO Box 4396
DARWIN NT 0801

Dear Hon Justice Pepper,

RE: HYDRAULIC FRACTURING INQUIRY – INFORMATION REQUEST

I refer to your letter dated 25 July 2017 requesting further information on certain issues identified in the Inquiry's Interim Report, released on 14 July 2017.

Many of your questions go to the specific operational plans our member companies will carry out on their permit areas, and are thus covered in greater detail in those companies' responses.

APPEA is pleased to provide the following response to the Panel's questions. The sections highlighted in blue below repeat the text of the questions contained in your letter.

Flowback and Produced Water

The Interim Report includes a discussion on the composition of flowback and produced water. As noted in the report, these waters may contain inorganic and organic chemicals of potential environmental significance in addition to those that were originally found in hydraulic fracturing fluid.

The Inquiry understands that interest holders are required to disclose the chemicals used in hydraulic fracturing fluids to the government. However, the identity and concentration of geogenics, that is, chemicals extracted from the shale formation as a result of the hydraulic fracturing process, do not need to be disclosed. The Panel currently has no Australian information on the actual composition of flowback or produced water from shale gas operations.

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

- (a) a risk assessment of the geogenic components of flowback and produced water; and
- (b) disclosure of the chemical composition of flowback and produced water.

Please comment on this proposal.

APPEA supports risk assessments of the geogenic components of flowback and produced water and disclosure of the chemical composition of flowback and produced water.

Risk assessments of the geogenic components of flowback and produced water are undertaken by APPEA members operating in Queensland under conditions attached to environmental approvals.

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In the Northern Territory, regulatory mechanisms exist to put in place such a condition. Conditions can be placed on approved activities through a Ministerial Direction.

APPEA is aware that Origin Energy is providing additional information on the Amungee NW-1H flowback fluids to the Panel. Similarly, APPEA understands that Santos has provided evidence to the Panel of its project's chemical risk assessments that are published on the Santos website.

Spills

The Inquiry has been provided with submissions to the effect that the likelihood of contaminants in a spill rapidly reaching a surface aquifer prior to any clean up action is low because:

- groundwater aquifers are quite deep (between 50 and 200m below surface in the Beetaloo Sub-basin);
- where appropriate containment facilities are used, spills are unlikely; and
- the interaction with the soil zone reduces the concentrations of many contaminants.

The Panel currently has no specific information regarding the potential for toxic contaminants in flowback and produced water to be removed or diluted when it passes through the soil profile.

In that regard, the Panel requests specific information on the likelihood that on-site surface spills of chemicals or wastewater could reach the groundwater aquifer, and if they do, what could be done to remediate the system.

As stated above, the risk of surface spills impact on groundwater in the Northern Territory is low as:

- groundwater aquifers in the region of shale deposits are quite deep (such as between 50 and 200m below surface in the Beetaloo Sub-basin);
- where appropriate containment facilities are used, spills are unlikely;
- the interaction with the soil zone reduces the concentrations of many contaminants; and
- when spills do occur, containment and remediation action is prompt and extensive to limit further spread of contaminants to deep soils or groundwater.

The oil and gas industry has comprehensive safety and environmental management systems to ensure safe and environmentally responsible operations. Spill preparedness and response is one component of an operator's overall management systems.

As stated on p. 42 of APPEA's submission to the Background and Issues Paper¹ the management of water, chemicals and other substances on the surface is a major focus for the oil and gas industry, as it is for many other industries.

Preventing spills is the primary focus of operators. The industry's priority is to ensure effective process and engineering controls to prevent occurrence of the event. The best practice approach is to minimise the amount of these materials on site, contain materials as fully as possible, reuse or recycle them to the greatest extent feasible, and dispose of the remainder offsite.

¹ See submission #215

Operators conduct detailed risk assessments associated with spills to surface water, groundwater and terrestrial systems. Assessments depend on the specific site conditions, environmental conditions, fluid properties, potential volumes, and mitigation strategies. Santos, for example, evaluates such risks in human health and ecological risk assessments, such as those provided to the Panel in submission #168 at Appendix B. Risk assessments on hydraulic fracturing operations for coal seam gas have found that the potential for impact on groundwater from hypothetical spill scenarios is very low.

As stated by Santos, these risk assessments consider the presence of soil, and the potential for sorption (either physisorption or chemisorption). Biodegradation and other transformation processes in surface water and soils are also evaluated. Preliminary soil mapping for the Beetaloo exploration area has been undertaken by Origin as part of the Beetaloo Drilling Environmental Plan and soil sampling programs are deployed at the site scale before the civil design phase of development of specific activities.

There are studies that look at the role that soil plays in mitigation of spills, including for agriculture and other processes, such as Schwarzenbach et al as quoted by the US EPA².

In terms of remediation, in the very unlikely event that infiltration does reach shallow groundwater, a combination of dilution with groundwater and geochemical and biological processes provide for further attenuation of concentrations. Member companies' responses provide more information on remediation measures.

The United State Environmental Protection Authority (US EPA) reports a variety of technologies that can be used to ensure contaminants are either removed from a site or treated so they no longer pose a risk to human health and the environment³. The US EPA report is based on the implementation of over 600 field projects and is supported by a technology screening tool matrix. This tool contains 64 soil and groundwater remedial technologies supported by 209 cost and performance reports written by members of the Federal Remediation Technologies Roundtable.

Deep groundwater systems

Please advise if there has been any research undertaken in respect of the deep groundwater systems in the Beetaloo Sub-basin or other prospective shale gas regions. Please indicate what is known about them, including their depth, extent, quality, and prospectivity for use in hydraulic fracturing.

The Panel has been provided evidence of research into the deep groundwater systems in the Beetaloo Sub-basin by Origin⁴, Santos⁵ and Pangea⁶.

² Schwarzenbach, R.P., Gschwend, P.M., and Imboden, D.M. 2002. Environmental Organic Chemistry. 2nd edition. John Wiley & Sons, Hoboken, New Jersey www.chemistry.uoc.gr/courses/xhm405/04%20Environmental%20Organic%20Chemistry.pdf

³ US EPA, *Innovative Remediation Technologies: Field-Scale Demonstration Projects in North America, 2nd Edition*. Retrieved from www.epa.gov/sites/production/files/2015-04/documents/nairt_2000.pdf

⁴ See Beetaloo groundwater data provided with submission #153.

⁵ See section 5.2 in submission #168.

⁶ See Appendices 'H' & 'I' from submission #220.

Should the Moratorium be lifted, operators will acquire pressure and permeability data through the exploration and appraisal stages that will help assess the feasibility of deeper groundwater systems as a water source.

The Panel has been presented with independent evidence that shows the comparatively low use of water by the onshore gas industry⁷. Given the average and peak industry water demand has been quantified as 2.5GL/year and 5GL/year respectively in the Interim Report⁸, and that the sustainable recharge is estimated at 100 GL/year to 330GL/year for the shallower aquifer systems⁹, no adverse impact from the take of water is expected.

Solid waste management

As noted in the Interim Report, the solids produced by drilling represent a substantial waste stream associated with the production of shale gas. In the United States, the disposal of large amounts of drill cuttings produced by a full-scale industry is the cause of 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 this solid waste should be contained in a purpose-built and engineered centralised facility, or contained and managed on a per well pad basis as is currently the case for the exploration regime. Please comment on this matter.

Further exploration is required to assess the potential size and scale of operations. Exploration and appraisal will provide information on the properties of the cuttings and its potential reuse or disposal. While estimates of potential industry scale have been provided to the Panel, it is too early in the cycle to accurately assess the need for a centralised facility for drill cuttings.

In the exploration phase drill cuttings can be managed on a per well basis. Should the industry develop further, an investigation of the variety of disposal options will be undertaken. Operators will seek to work collaboratively on the viability of a centralised solid waste depository, respecting the requirements of the *Competition and Consumer Act 2010 (Cwlth)*.

Cuttings that involve inert materials (generally outside of the horizontal sections of the well) are earthen material; reuse and recycling of these materials is common. Where material and land conditions are suitable, drill cuttings may be reused by mixing with soil, aggregate or organic material for soil stabilisation or as soil conditioner to assist with rehabilitation. Where on-site reuse is not suitable, drill cuttings can be beneficially re-used.

There are a range of options for the beneficial reuse of drill cuttings.¹⁰ These include

- road spreading
- fill material
- daily cover material at landfills and
- aggregate or filler in concrete, brick, or block manufacturing.

⁷ See submission #302.

⁸ See section 7.4.1.1 on p. 53.

⁹ *ibid*

¹⁰ Drilling Waste Management Information System web.ead.anl.gov/dwm/

Cuttings are sent for direct disposal where no other option exists.

Health assessment

Chapter 10 of the Interim Report includes a proposal that a site specific human health risk assessment should be required for each shale gas project in order to fully inform the impact of the project on public health. Please comment on this proposal.

Human health risk assessments (HHRA) provide useful qualitative, semi-quantitative, or quantitative estimates of potential human health risks where they are considered through potential exposure pathways. In cases of public health concern, it is appropriate that risk assessments are undertaken commensurate with the nature and scale of activity proposed.

The panel has been provided with evidence of site specific HHRA undertaken by APPEA members for onshore gas developments projects in Queensland.

Further exploration activity is required to identify the necessary data to conduct site specific HHRA for full field development proposals in the Northern Territory.

The industry remains of the view that the existing regulatory framework is appropriate for the nature and scale of activity proposed in the near term, should the Northern Territory Government lift the moratorium.

Traffic

The Panel notes the community's concern about increased traffic along the Stuart and Carpentaria Highways should the industry be given approval to proceed. This is not just a matter of road safety and increased potential for spills, but also an issue of "amenity" for road users in general, noting that the Stuart highway is a major route for grey nomad traffic during the dry season.

Please indicate the nature and extent of the increase, relative to current conditions, in vehicle movements during each state of development. Please also indicate whether transportation by rail has been considered given the proximity of the rail line corridor to the relevant lease areas in the Beetaloo.

Equipment volumes are provided to the NT regulator for exploration activities as part of the approval process in Environment Management Plans (EMP).

Detailed road / traffic impact assessments for developments are undertaken in any project proposal and require approval of various agencies. Road and traffic assessments typically comprise the following:

- Acquisition and characterisation of baseline / background traffic and road use data
- Quantification of the number and type of project vehicle movements – in consideration of starting location and timing of traffic movements
- Assessment of safety risks
- Assessment of pavement impacts
- Assessment of traffic impacts – trip duration, speed impairment and amenity

- Identification of potential upgrades – such as pavements, lane widening, overtaking lanes, turning lanes etc. and
- Identification of impact management and maintenance

Many Northern Territory roads already have significant levels of traffic and the possibility of additional transport movements to support exploration activities needs to be seen in context. According to the Australian Bureau of Statistics, over 25,319,000 tonnes of road freight is transported in the Northern Territory.¹¹ Traffic volume information collected by the NT Department of Transport (DoT) presents annual average daily traffic (AADT) volumes along key transport corridors. For example, the Stuart Highway near Tennant Creek records 3642 vehicle movements per day.¹²

To assist the Panel in assessing potential risks, links are provided below to publicly available road use and traffic impact assessments for Santos developments in Queensland and New South Wales. It should be noted that projects in the NT will be less dependent on public roads due to the location of the fields. The findings of QLD assessments may not be directly relevant to the NT. If development was to proceed in the NT, similar modelling would be undertaken based on local conditions and development plans.

- Santos GLNG Gas Field Development Project - [Traffic and transport assessment report](#)
- Santos Narrabri Gas Project – [Traffic Impact Assessment](#)

These assessments show the nature and quantum of vehicles, including duration of road use. It is important to note that the majority of vehicle movements is during the early construction phase of a development (years one to three). This traffic is associated with the movement of modular compression, equipment and facilities as well as drilling and completion equipment and materials, and their corresponding workforce. Following construction (years four to 25+), vehicle movements are reduced to operations and maintenance activities and their associated workforce as well as on-going well drilling and completion activities.

Rail transport is considered wherever possible to reduce impact on roads, noting the effectiveness of this depends on location and other considerations (increase in double handling, flexibility, etc).

It is important to consider the role that overall regulation can have an impact on traffic movements. For instance, traffic can be reduced significantly by using on-site water, waste reuse and recycling practices, and the use of multi-well drill pads. Restrictions that limited these operational efficiencies could inadvertently increase road traffic.

¹¹ 9223.0 - Road Freight Movements, Australia, 12 months ended 31 October 2014
www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/9223.012%20months%20ended%2031%20October%202014?OpenDocument

¹² transport.nt.gov.au/_data/assets/pdf_file/0008/367316/2015-atr-final-aug-16.pdf

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 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.

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.

Finally, please comment on section 9.8 of the Interim Report, which has been duplicated at **Attachment A**.

APPEA cautions against suggestions to create new greenhouse gas reporting measures which duplicate or are inconsistent with the well-established and comprehensive national framework.

- *implementation of leading practice standards for emission reduction, such as the United States Environmental Protection Agency's New Source Performance Standards, Permitting Rules for the Oil and Natural Gas Industry;*

Prescriptive regulatory standards, such as the United States Environmental Protection Agency's *New Source Performance Standards, Permitting Rules for the Oil and Natural Gas Industry* (APPEA notes certain aspects of which are proposed to be stayed as the US EPA reconsiders its application¹³), are unlikely to drive low cost and effective emissions reduction activities.

Australia's national approaches to emissions reduction (the Emissions Reduction Fund (ERF) and ERF safeguard mechanism) do not specify actions to be taken to reduce emission but rather establish purchasing and crediting approaches through the ERF and safeguarding approaches through the ERF safeguard mechanism that encourage companies to find their own least cost and effective emission reduction approaches. The previous carbon price mechanisms, while taking a different approach by directly pricing carbon, similarly allowed emitters the freedom to seek out

¹³ See www.epa.gov/controlling-air-pollution-oil-and-natural-gas-industry/actions-and-notice-about-oil-and-natural-gas, specifically the notices dated 18 April 2017 and 12 June 2017, for more information.

their own responses to the emissions reduction incentives provided by the carbon price. This has been long recognised as a more cost-effective approach to emissions reductions.

While documents such as the United States Environmental Protection Agency's *New Source Performance Standards, Permitting Rules for the Oil and Natural Gas Industry*, can provide useful sources of information for the industry on possible emissions reduction activities¹⁴ they do not, in an Australian context, form an appropriate basis for a regulatory approach, particularly at a jurisdictional level.

- baseline measurements of methane levels prior to development; and

Research into baseline measurements and methodologies is underway in various parts of Australia, most notably through the Gas Industry Social and Environmental Research Alliance (GISERA), a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. GISERA has undertaken, and is undertaking, a range of relevant studies in Queensland and New South Wales, including:

- Studies on methane seepage in the Surat Basin in Queensland¹⁵ (a project that will detect and measure methane seeping from underground in the Surat Basin, and identify sources of methane to provide a baseline of methane emissions on a regional scale).
- Regional methane emissions in NSW CSG basins¹⁶ (a project that will identify and quantify methane emission sources such as CSG infrastructure, feedlots, coal mining, legacy bore holes in the Pilliga region and result in a detailed inventory and map of methane emissions for the Pilliga region that can be used to compare emissions once/if large scale gas extraction starts).

There may be an opportunity for the Northern Territory to leverage off this work.

- ongoing monitoring of methane levels at key points during exploration, development and production.

Ongoing measurement and reporting for all parts of the gas supply chain is a requirement under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act). This measurement and reporting is comprehensive and one of the key objectives of NGERs is to "... avoid duplication of similar reporting requirements in the states and territories"¹⁷. States and Territories have access to NGERs data and additional requirements at a jurisdictional level are not required.

- the technologies that are currently available to obtain baseline measurements of emissions, including the possible use of drones;

Many of the technologies that can or have been used to obtain baseline measurements are considered in detail in the GISERA reports mentioned above.

¹⁴ Noting that many of the United States Environmental Protection Agency's New Source Performance Standards, Permitting Rules for the Oil and Natural Gas Industry relate to existing practice in the modern Australian petroleum industry. These include use of dry gas seal centrifugal compressors rather than wet seal centrifugal or reciprocating compressors, use of instrument air for instrumentation and control valves, rather than gas driven devices, minimal use of gas driven pumps and capture and flaring of well completion emissions.

¹⁵ See gisera.org.au/project/methane-seepage-in-the-surat-basin for more information.

¹⁶ See gisera.org.au/project/regional-methane-emissions-in-nsw-csg-basins for more information.

¹⁷ See www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme.

A range of relevant studies are also underway, using various technologies, through a number of Australian universities. For example, a joint Adelaide University/Macquarie University study showed that a new type of laser developed by the University of Adelaide is promising major advances in remote sensing of greenhouse gases. The technology may allow researchers to detect small concentrations of these gases at considerable distances. According to the research¹⁸:

“Remote detection of greenhouse gasses such as methane and ethane opens up the prospect of differentiating between various potential emission sources, such as natural gas extraction and agriculture ...”

- 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;

As noted above, ongoing measurement and reporting for all parts of the gas supply chain is a requirement under the NGER Act. This measurement and reporting is comprehensive and one of the key objectives of NGERs is to “... avoid duplication of similar reporting requirements in the states and territories”¹⁹. States and Territories have access to NGER data and so additional requirements at a jurisdictional level are not required.

Requirements are set out in detail in the NGER Determination and NGER Technical Guidelines. These documents are reviewed and updated on a regular basis²⁰ and any changes to monitoring and measurement requirements should be pursued through these long-established processes.

- the use of emission limits that, if exceeded, would trigger an investigation, make-good requirements and/or a penalty;

Emission limits are set by the Clean Energy Regulator under the ERF safeguard mechanism. Any onshore gas facility established in the Northern Territory that emits over 100,000 tonnes of carbon dioxide equivalent (100kt CO₂-e) in greenhouse gas emissions each year will be covered by the ERF safeguard mechanism. Under the safeguard Rule, such facilities have a baseline set by the Clean Energy Regulator that it would then need to keep emission levels within.

A compliance process that incorporates investigations, make-good requirements and/or penalties, is in place under the ERF safeguard mechanism²¹. Specifically, if a facility’s emissions exceed or are expected to exceed its baseline, the facility operator has a number of options available to manage the excess emissions, including

- Applying for a calculated baseline or variation to their baseline.
- Surrendering Australian carbon credit units (ACCUs) to offset emissions and bring net emissions below the baseline.
- Applying for a multi-year monitoring period to allow additional time to reduce emissions.

¹⁸ See www.adelaide.edu.au/news/news83962.html for more information and www.osapublishing.org/ol/fulltext.cfm?uri=ol-41-7-1676&id=338703 for a copy of the article, *Versatile and widely tunable mid-infrared erbium doped ZBLAN fiber laser*.

¹⁹ See www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme.

²⁰ The NGER Determination has been updated annually since 2009 (see www.environment.gov.au/climate-change/greenhouse-gas-measurement/nger/determination for more information) and the NGER Technical Guidelines have been updated every year since 2012 (see www.environment.gov.au/climate-change/greenhouse-gas-measurement/nger/technical-guidelines for more information).

²¹ See www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Managing-excess-emissions for more information.

- Applying for an exemption where emissions are due to exceptional circumstances such as a natural disaster or criminal activity.

There are a range of enforcement options available to the Clean Energy Regulator where a responsible emitter fails to take one of the above actions. These options include entering into an enforceable undertaking, issuing an infringement notice, or court proceedings to seek an injunction or civil penalties.

This means duplication under a jurisdictional approach to the use of emission limits is not required.

- *the need for transparency when setting emission limits; and*

The processes used by the Clean Energy Regulator to establish baselines under the ERF safeguard mechanism is set out in the safeguard rule and described in detail on the Regulator's website²². This provides transparency around the process undertaken by the independent Regulator.

Under the safeguard rule, a full list of facilities for which baselines have been established is publicly available from the Clean Energy Regulator's website²³. This provides transparency around the baselines established for each facility and the emissions limits they are expected to remain within.

- *whether or not baseline measurements and on-going monitoring should be undertaken by an independent body.*

While, under the NGERs framework, measurement and reporting is undertaken by the facility operator, each NGER report is subject to audit by an independent and specialised auditor.

Audits are also required for reports submitted under the ERF and ERF safeguard mechanism.

The legislative framework for NGER and ERF audit requirements is contained in the NGER Act, *National Greenhouse and Energy Reporting Regulations 2008* (NGER Regulations), *National Greenhouse and Energy Reporting (Auditor Registration) Instrument 2017* (Auditor Registration Instrument) and *National Greenhouse and Energy Reporting (Audit) Determination 2009* (Audit Determination)²⁴.

Only registered auditors can undertake audits consistent with NGERs requirements. To become a registered auditor, an auditor must meet the detailed requirements (knowledge of the relevant legislation and knowledge and experience in auditing). Details on the types of knowledge and evidence are laid out in the Auditor Registration Instrument²⁵.

²² See www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines for more information.

²³ See www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Safeguard-baselines-table for more information.

²⁴ See www.cleanenergyregulator.gov.au/Infohub/Audits/audits www.cleanenergyregulator.gov.au/Infohub/Audits/audits-in-our-schemes and www.cleanenergyregulator.gov.au/Infohub/Audits/legislative-framework-for-audits for more information.

²⁵ See www.cleanenergyregulator.gov.au/Infohub/Audits/register-of-auditors for more information including a public register of auditors that meet NGERs audit requirements.

Through its compliance program, the Clean Energy Regulator conducts regular audits of NGER reporters. These audits are in addition to regular audits that are required to be conducted for every NGER report submitted to the Regulator.

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

In addition to the comments above, APPEA makes the following comments on the risk assessment framework presented at Table 9.2 in the Interim Report and reproduced at Attachment A in the Panel's letter to APPEA dated 25 July 2017.

The onshore gas industry across Australia, including in the Northern Territory, is required to measure, report and account for all of its greenhouse gas emissions, through the *National Greenhouse and Energy Report Act 2007* (NGER Act). This Act established the National Greenhouse and Energy Reporting Scheme (NGERS)²⁶, and associated *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (NGER Determination)²⁷. These instruments provide methods and criteria for calculating greenhouse gas emissions and energy data under the NGER Act and the *National Greenhouse and Energy Reporting (Measurement) Technical Guidelines* (NGER Technical Guidelines)²⁸. This is designed to assist emitters to understand and apply the NGER Determination. The NGER Technical Guidelines outline calculation methods (including direct monitoring) and criteria for determining greenhouse gas emissions, energy production, energy consumption and potential greenhouse gas emissions embodied in natural gas.

Emissions from all stages of onshore production, supply and use are measured, and reported by the Australian Government Department of the Environment and Energy (the Department) in Australia's *National Greenhouse Accounts*²⁹. Estimates of fugitive emissions of methane during onshore gas extraction activities are based on facility level data submitted by companies through NGERS. These estimates are reported by the Department within the *National Greenhouse Accounts* as part of fugitive emissions from gas exploration, natural gas production and processing, venting and flaring. The emissions estimation methods used in the *National Greenhouse Accounts* are subject to external independent review each year by an Expert Review Team selected by the United Nations Framework Convention on Climate Change (UNFCCC)³⁰.

The Emissions Reduction Fund (ERF) safeguard mechanism, set out in the *National Greenhouse and Energy Reporting Act 2007* (the Act), through amendments included in the *Carbon Farming Initiative Amendment Act 2014*, that establish the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (safeguard Rule), sets baselines for facilities emitting over 100kt CO₂-e each year and requires emitters to keep emissions within those baseline levels³¹. Baselines are set by the Clean Energy Regulator.

²⁶ See www.environment.gov.au/climate-change/greenhouse-gas-measurement/nger for more information. NGERS is administered across Australia, including in the Northern Territory, by the Clean Energy Regulator. For information about the Regulator's administration of NGERS, see www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme.

²⁷ See www.environment.gov.au/climate-change/greenhouse-gas-measurement/nger/determination for more information.

²⁸ See www.environment.gov.au/climate-change/greenhouse-gas-measurement/nger/technical-guidelines for more information.

²⁹ See www.environment.gov.au/climate-change/greenhouse-gas-measurement/tracking-emissions for more information.

³⁰ See unfccc.int/documentation/documents/advanced_search/items/6911.php?preref=600009533#beg for a copy of the most recent UNFCCC report for Australia.

³¹ See www.environment.gov.au/climate-change/emissions-reduction-fund/about/safeguard-mechanism for more information. The ERF safeguard mechanism is administered by the Clean Energy Regulator. See www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism for more information about the Regulator's administration of the mechanism.

All of Australia's major onshore gas facilities, offshore gas facilities and LNG facilities are covered by the ERF's safeguard mechanism. Under the safeguard rule, a full list of facilities for which baselines have been established is publicly available from the Clean Energy Regulator's website³².

Conclusion

APPEA appreciates the opportunity to contribute to the Inquiry and the important work that the Panel is undertaking. Please contact [REDACTED] or [REDACTED] should you or the Taskforce staff wish to discuss any aspect of APPEA's comments.

Yours sincerely,



Matthew Doman
Director – Northern Territory

³² See www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Safeguard-baselines-table for more information.