SCIENTIFIC INQUIRY INTO
HYDRAULIC FRACTURING
IN THE NORTHERN TERRITORY

Draft Final Report

January/February 2018

frackinginquiry.nt.gov.au

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Chapters 1-3
Purpose, work and findings of the Inquiry

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What we have done

- We have met 10 times
- We went to see a frack at Moomba in South Australia
- We have released a *Background and Issues Paper*
- We conducted hearings and community meetings in March 2017
- We visited CSG gas fields in Queensland and spoke to people affected by CSG
- We consulted pastoralists and visited cattle stations
- We released an *Interim Report*
- We conducted more hearings and community meetings in August 2017
- We released the ACIL Allen and Coffey reports
- We visited Mereenie gas fields
- We released the *draft Final Report* in December 2017 including draft recommendations

What we will do next

- Conduct a final round of community and remote consultations, including public hearings, where we will explain the main findings and recommendations of the draft Final Report
- Listen to what people have to say about the draft Final Report
- Consider any further submissions received
- Where necessary, revise the draft Final Report, including the draft recommendations
- Report to Government in March 2018

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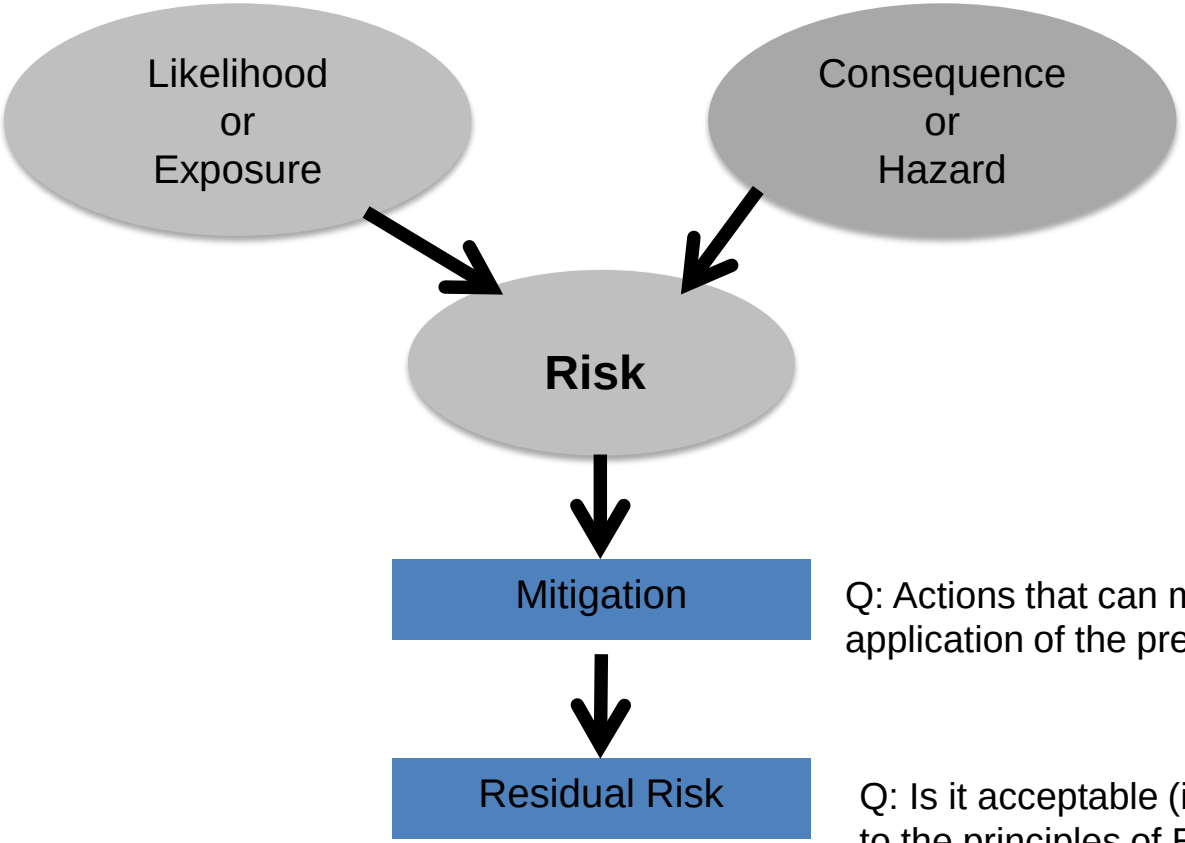
Chapter 4
Evidence and Risk Assessment Methodology

Risk Assessment Methodology



Q: Actions that can minimise the risk (note application of the precautionary principle)?

Q: Is it acceptable (including by reference to the principles of ESD)?

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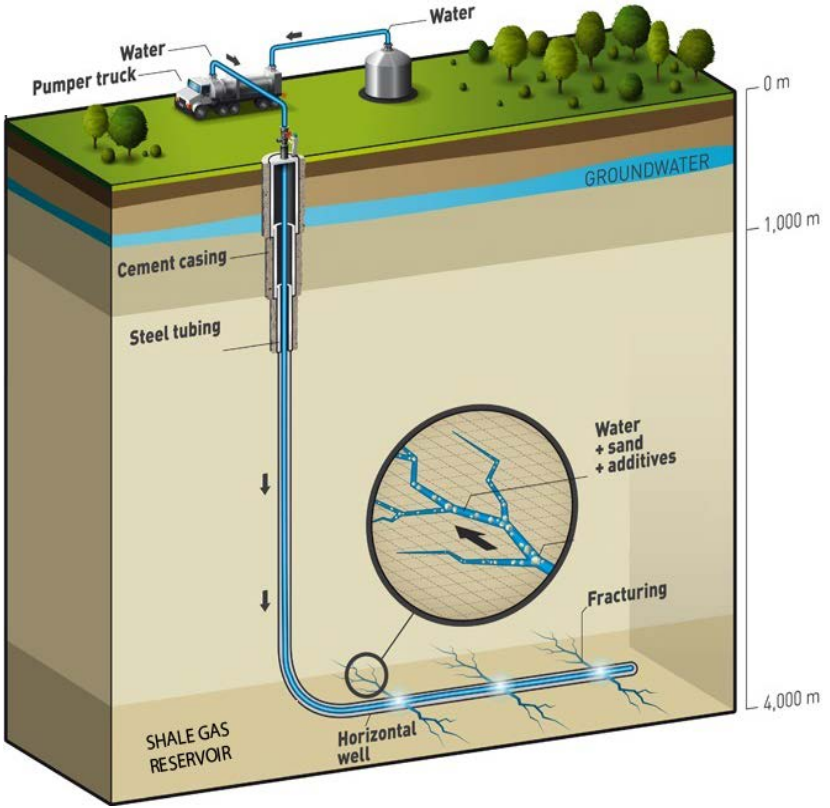
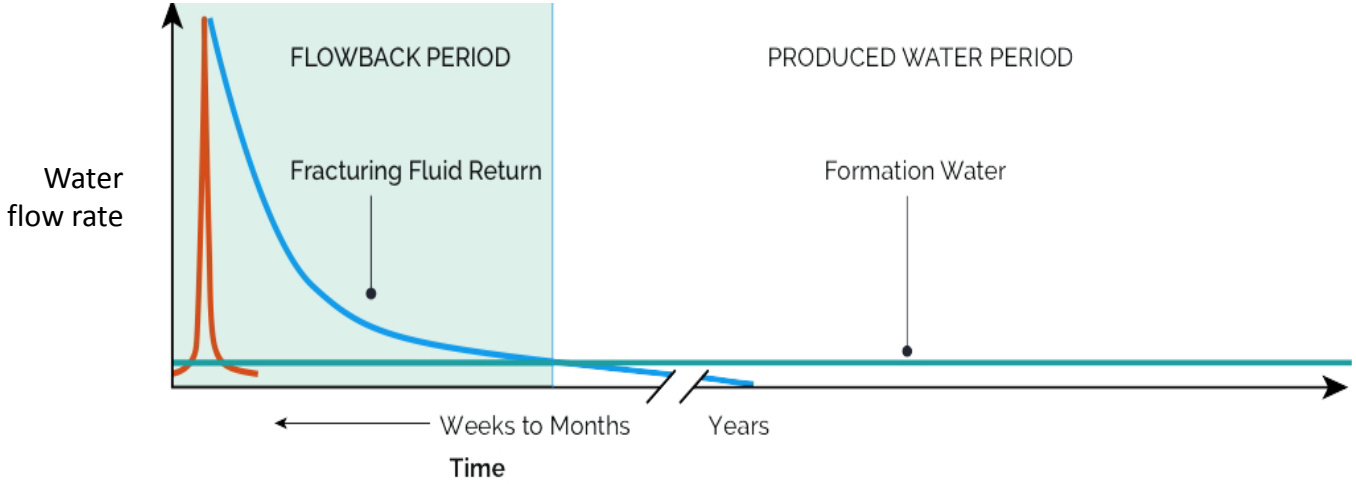
Chapter 5
Shale Gas Extraction and Development

Well life cycle

- Design phase
- Construction phase
- Hydraulic fracturing
- Operation/production
- Decommissioning and abandonment



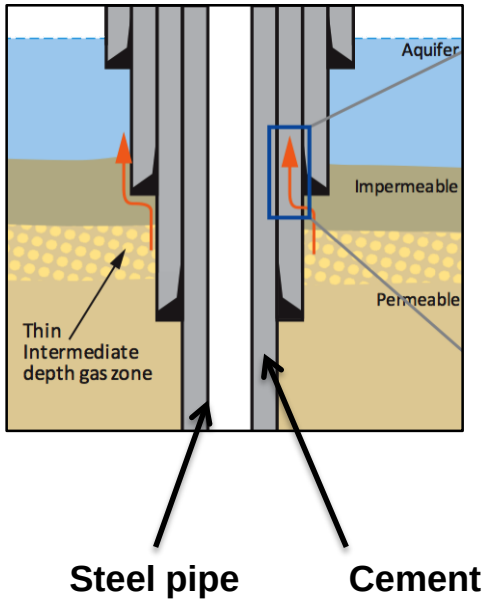
Wastewater sources



- Sources:
  - Potential for re-use of Flow back water – return from hydraulic fracturing (weeks to months)
  - Produced water – over the lifetime of the well
- flowback water
- Composition:
  - Fracking chemicals
  - Chemicals from the shale layer

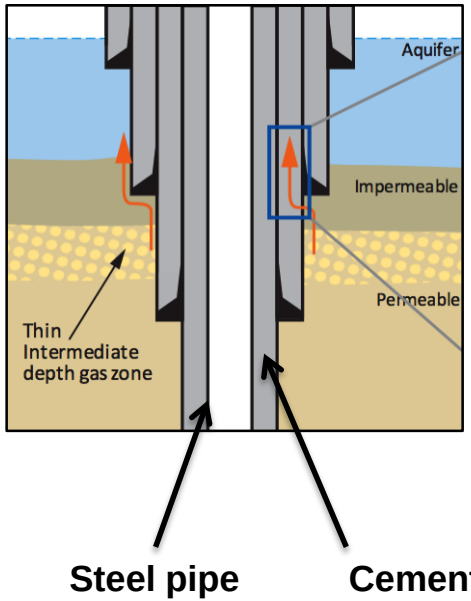
Well Integrity

- Crucial for safe operation and to ensure that groundwater is not contaminated
- Types of failure:
  - well barrier failure – one barrier fails but no loss of fluids
  - well integrity failure – all barriers fail and fluids can flow into and out of the well – may result in groundwater contamination
  - failures can be related to casing and/or cement



Barriers

- Commissioned CSIRO to conduct in-depth world-wide review
- CSIRO review found that all integrity failure (all barriers fail) rates were typically less than 0.1% of wells:
- Single barrier failure rates are higher (1-10%) historically but are rare for high quality constructed wells (Category 9 or above)
- Single barrier failures do not result in release of gas or fluid to the environment



Barriers

Recommendations

- That the Government develop and mandate enforceable code of practice – minimum requirements (***Rec 5.3***)
- That all wells be Category 9 wells or above (***Rec 5.3***)
- That gas companies develop and implement a well integrity management system for each well (compliant with ISO 16530 – 1:2017) (***Rec 5.4***)
- That there be an enforceable code of practice for abandonment of well, with on-going monitoring (***Recs 5.1*** and ***5.2***)

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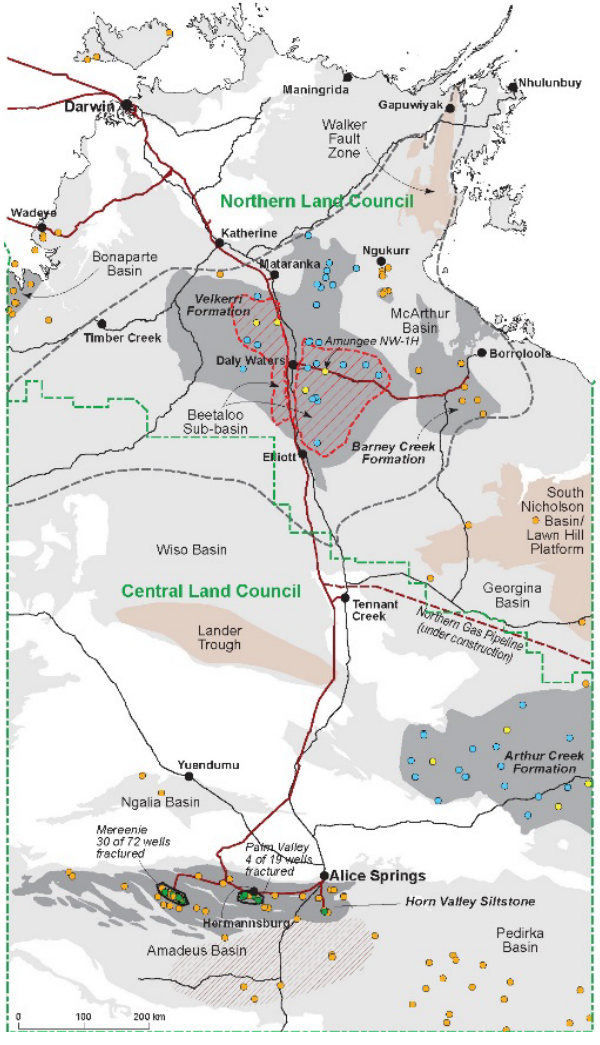
Chapter 6
Onshore Shale Gas in Australia and the NT

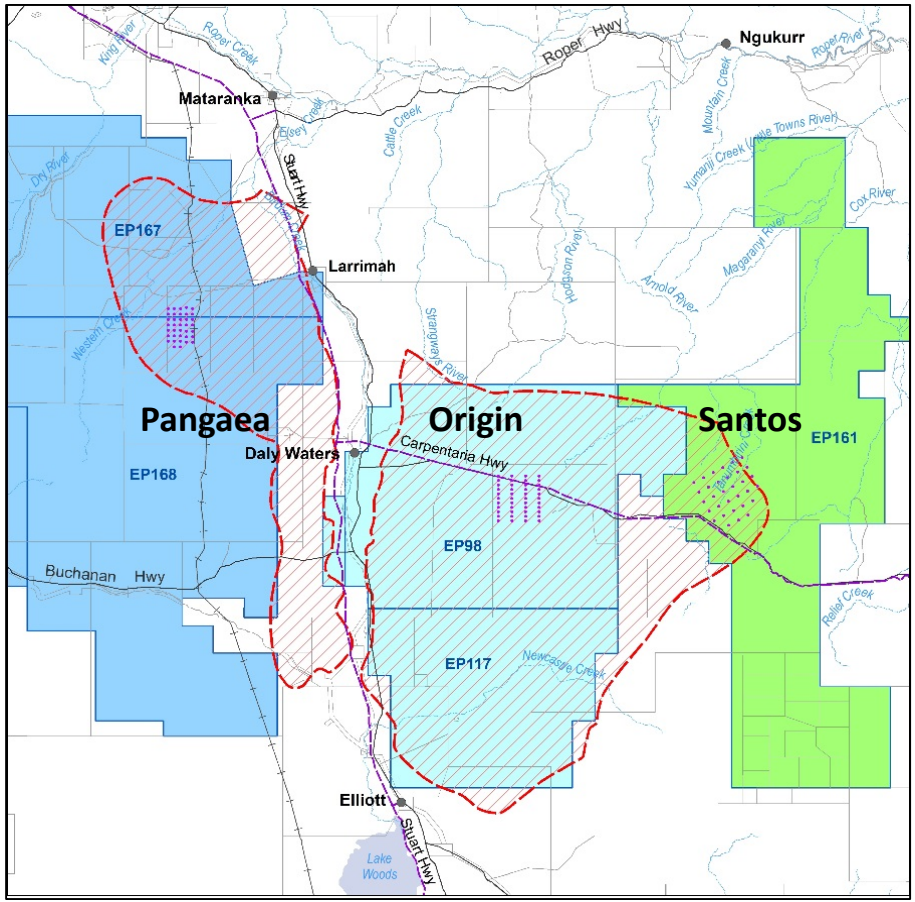
Where is the shale gas?

- There are six major basins
- Most of them are unexplored
- ~ 70% of the total shale gas is in the Beetaloo Sub-basin
- There has already been hydraulic fracturing of conventional wells (sandstone) already in the NT (eg the Mereenie)



What might development look like?

- 1-2 onshore shale gas resources might be developed in next 5-10 years
- Beetaloo Sub-basin is likely to be first
- Industry estimates between 1,000 - 1,200 wells and 150-200 drilling pads in Beetaloo



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Chapter 7
Water

Water

- Inquiry focused on ensuring acceptable protection of surface and groundwater resources:
  - Water supply (quantity)
  - Water quality (contamination)
  - Aquatic ecosystems
- Assessed 20 water-related risks. Made 19 recommendations
- Four high-priority issues:
  - Unsustainable groundwater use
  - Contamination of groundwater from leaky wells
  - Contamination of groundwater by surface spills of fracking fluid chemicals (transit or storage) and wastewater
  - Effects on surface or groundwater-dependent ecosystems

Water supply

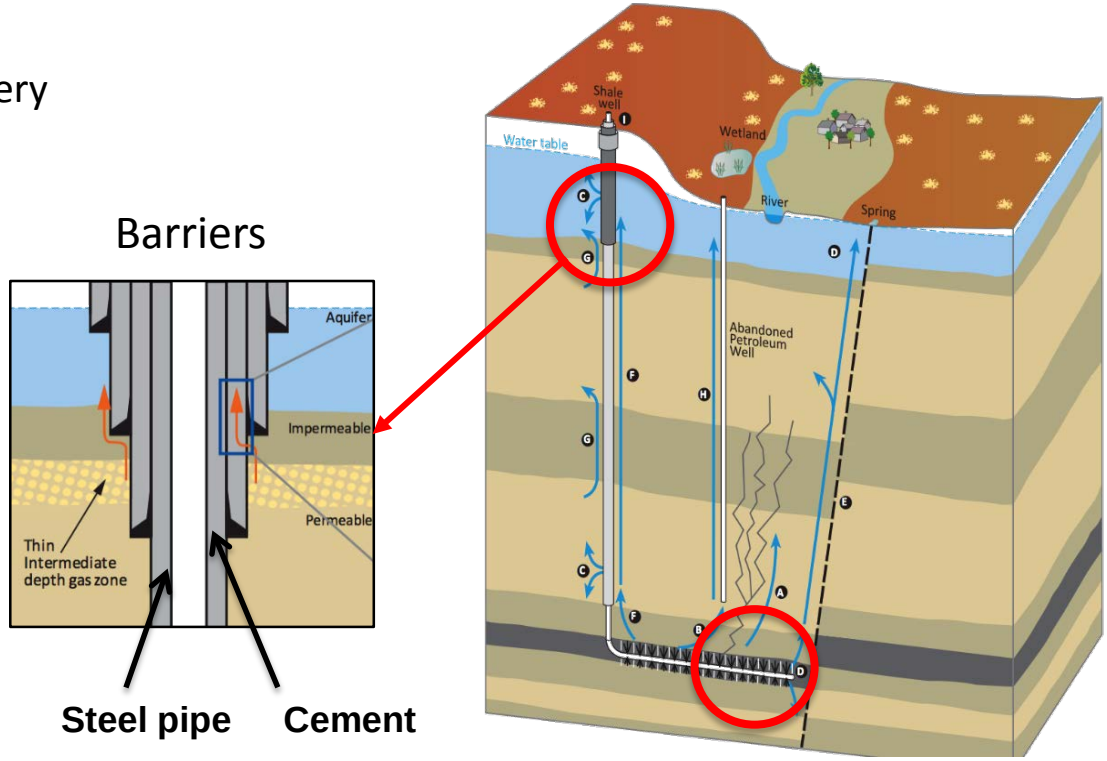
- Shale gas industry likely to use groundwater
- Industry in Beetaloo Sub-basin likely to use 2,500-5,000 ML per year (1,000-2000 Olympic swimming pools)
- Strategic Regional Environmental and Baseline Assessment (**SREBA**) (***Recs 7.4***, ***7.18*** and ***7.19***)
  - Better information on groundwater (recharge, movement) – regional groundwater model
  - Better information on groundwater-dependent ecosystems, e.g. Mataranka springs
- Gas companies become subject to the Water Act (need to obtain a licence and pay for water extracted) (***Rec 7.1***)
- Changes to water management (e.g. Water Allocation Plans) (***Rec 7.6***)
- No take of surface waters (rivers, lakes, wetlands) (***Rec 7.5***)
- Restrictions on distance between gas company supply bores and domestic or pastoral water bores (***Recs 7.7*** and ***7.10***)

Water quality

- Key issue is to ensure that shale gas wastewater does not pollute surface or groundwater
- Minimise the risk of contamination from:
  - Wastewater and chemicals (flowback and produced water)
  - Methane – not toxic, but a greenhouse gas
- Panel focused on two main potential contamination pathways:
  - Leaky wells (well integrity)
  - Surface spills

Two main contamination pathways

- Leaky well – where it goes through the aquifer (multiple metal and cement barriers)
- The hydraulic fracturing area – very large distance (2 - 4km) between fracturing and surface aquifers

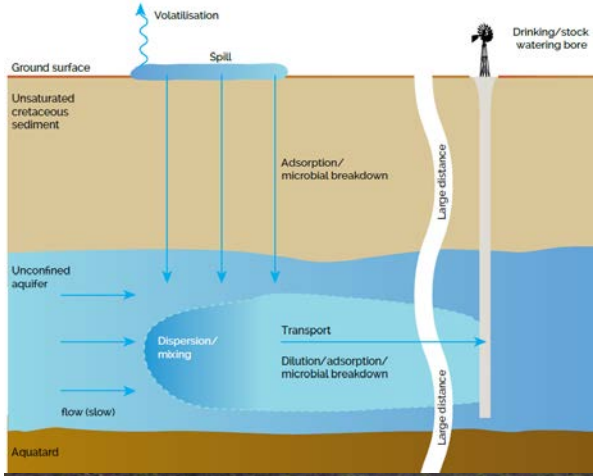


Risk of contamination by well integrity failure

- Need better information on chemicals to be used, and those from the shale formations in gases and liquids (***Rec 7.9***)
- High construction standards (Category 9) for wells, with independent regulator certification (***Rec 7.10***)
- Periodic integrity testing through the life of the well (***Recs 7.10, 5.3*** and ***5.4***)
- On-going monitoring of groundwater and public reporting (***Rec 7.10***)

Risk of contamination by surface spills

- Spills highly likely to occur <u>but</u> in small volumes therefore unlikely to get through the soil/rock layer to the aquifer. Good management of wastewater is essential.
- Recommendations:
  - Enforceable wastewater and spill management plan for each well pad (***Rec 7.11***)
  - Use of enclosed tanks to hold wastewater (not open ponds) (***Rec 7.11***)
  - Treatment of well pad to prevent spills entering groundwater (***Rec 7.11***)
  - Monitoring of groundwater with information publically available (***Rec 7.11***)
  - No reinjection of treated or untreated wastewater (***Rec 7.13***)
  - No discharge of treated or untreated wastewater to surface waters (***Rec 7.16***)
  - The Government to review wet season transport of chemicals and wastewater (***Rec 7.12***)
  - Minimise impacts of infrastructure (roads, pipelines) on flow and quality of surface waters (***Rec 7.17***)



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Chapter 15
Strategic Regional Environmental and Baseline Assessment (SREBA)

Strategic Regional Environmental and Baseline Assessments (**SREBA**)

- Lack of critical baseline data across all knowledge areas is the single biggest impediment to assessing/quantifying the post development impact of any onshore shale gas industry
- There is presently a lack of baseline data required to:
  - Fully inform understanding of the Territory's unique environmental values and ecosystems
  - Fully facilitate strategic water and land use planning
  - Fully inform issues associated with social impacts, human health and Aboriginal people and their culture

- A SREBA provides the foundation for a planning framework that:
    - gives certainty to both the public and industry
    - ensures good environmental outcomes by addressing the potential for cumulative impacts across broad regions

- A SREBA should be completed and findings implemented prior to approval being given for commercial production. It can be undertaken during exploration

- The Beetaloo Sub-basin should be the first priority for any SREBA

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Chapter 8
Land

Land-based Risks of Onshore Shale Gas Development

The Panel assessed potential risks to:

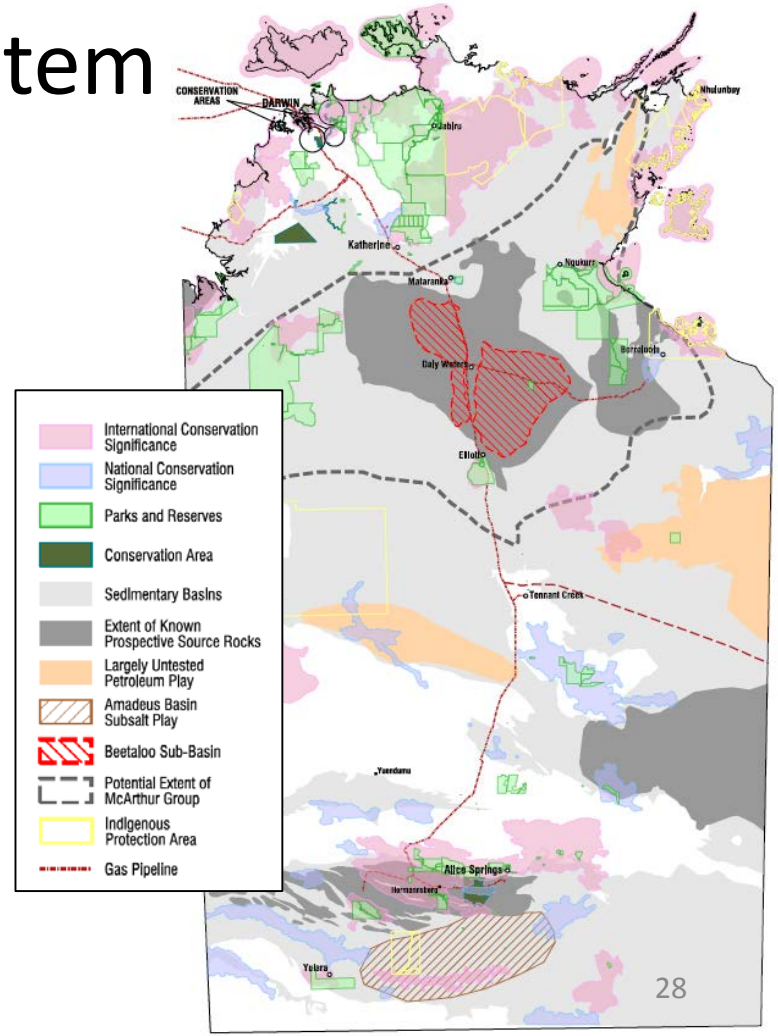
- Biodiversity and ecosystem health
- Landscape amenity

The Panel determined that the following needs to be ensured:

- no impact on terrestrial biodiversity values at regional scale
- maintenance of healthy terrestrial ecosystems
- shale gas infrastructure not highly visible
- heavy-vehicle traffic does not cause unacceptable impacts on amenity

Biodiversity and ecosystem health

- Shale gas development in areas of high conservation value considered to be unacceptable.
- The Panel considered the current conservation framework, but also knowledge gaps which should inform future conservation priorities.
- The Panel recommends:
  - National parks and other conservation areas be legislated as ‘no go’ zones (***Recs 8.1*** and ***14.4***)
  - Strategic regional biodiversity assessments (**SREBA**) to inform requirements for further conservation (***Rec 8.5***)



Invasive species, especially weeds

- The Panel considered the risks posed by weeds, feral animals and invasive ants. Spread mechanisms and feasibility of control were considered.
- Weeds recognised as posing highest risk
- To mitigate the impact of weeds the Panel recommended that:
  - Baseline weeds assessments before exploration (***Rec 8.2***)
  - Weed management plans (***Rec 8.3***)
  - Dedicated weed management officers and ongoing monitoring (***Recs 8.2*** and ***8.3***)

Changes to fire regimes

- The Panel considered how fracking might affect fire regimes and current fire management programs in the NT.
- The Panel recommended that:
  - Gas companies comply with statutory fire management plan (***Rec 8.4***)
  - Baseline fire mapping (***Rec 8.4***)
  - Control of ignitions
  - Ongoing monitoring and management (***Rec 8.4***)

Changes to native vegetation

- The Panel considered how an onshore shale gas industry could affect the structure and function of native vegetation. The Panel recommended the following measures to prevent unacceptable impacts:
  - Minimisation of vegetation clearing (***Recs 8.6*** and ***8.11***)
  - Avoidance of critical habitats such as rainforest and riparian zones (***Recs 8.10*** and ***8.12***)
  - Threatened species assessment (***Rec 8.5***)
  - Rehabilitation following operations (***Recs 8.7*** and ***8.11***)
  - Development and implementation of an environmental offset policy (***Rec 8.8***)

Roads and pipelines as ecological barriers

- The Panel considered how roads and pipelines could act as ecological barriers. The Panel recommended the following measures to minimise adverse impacts:
  - minimise corridor widths (***Rec 8.11***)
  - burial of pipelines (***Rec 8.11***)
  - minimise erosion and changes to water flow paths (***Recs 8.13*** and ***8.14***)

Landscape amenity

1. **Landscape transformation**

- Recommendations made to protect landscape amenity include:
  - National Parks as ‘no-go’ zones (***Recs 8.1*** and ***14.4***)
  - Well pads spaced by a minimum of 2 km and infrastructure not visible from major public roads (***Rec 8.15***)

2. Heavy vehicle traffic

- Large volumes of heavy vehicle traffic are required for hydraulic fracturing development
- Further assessment of this impact is required, but approaches to mitigate traffic impacts could include:
  - the use of railway
  - road upgrades

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Chapter 9
Greenhouse Gas Emissions

Greenhouse Gas Emissions (**GHG**)

- Production and use of shale gas emits CO_2 (carbon dioxide) and CH_4 (methane)
- These are greenhouse gases that contribute to global warming
- There is a concern about the impact of GHG emissions on global climate change from any new onshore shale gas field in the NT. That is, that any new onshore shale gas field will materially contribute to GHG emissions

Photo credit:

Global GHG

- Since pre-industrial times, CO_2 +42% to 399 ppm and methane (CH_4) +154% to 1.8 ppm
- Total annual global anthropogenic GHG emissions comprises 76% carbon dioxide and 16% methane emissions (the balance is nitrous oxide and fluorinated gases)
- Annual fugitive methane emissions from natural gas production are about 0.2% of the annual anthropogenic greenhouse warming effect of carbon dioxide (based on data over the past decade)
- Australia's GHG emissions: electricity generation (35%), stationary energy (18%), transport (17%), agriculture (13%), fugitive emissions (9%) and industrial processes and product use (6%)

Life-cycle emissions - Findings

Life Cycle Emissions for Shale Gas			
Upstream (Production)		**Downstream (Combustion – use)**	**Total** (CO_2-equivalent)
CO_2	CH_4		
5%	17%	78% (Mostly CO_2)	100% (72.5 g CO_2e/MJ; 100-year GWP)

- Gross life cycle GHG emissions is 26.5 Mt CO_2e/y for 1,000 TJ/d NT gas production
- Approximately 5% of Australian GHG emissions or 0.05% of global GHG emissions. At this level, the 'consequence' rating is 'low' and 'risk' is 'medium'
- Mitigation focus: upstream methane emissions
- Fugitive leaks can be reduced by 23% if good practices, including new technologies, are used
- Life-cycle emissions for shale gas are approx ½ that of coal for electricity production

Methane emission reduction - recommendations

- To reduce the risk of upstream methane emissions from onshore shale gas wells in the NT, that the Government implement the US EPA New Source Performance Standards of 2012 and 2016 (***Rec 9.1***)
- That an enforceable code of practice and baseline monitoring of methane concentrations be undertaken for at least one year prior to the commencement of shale gas production on a production licence (***Recs 9.2*** and ***9.3***)
- That baseline and ongoing monitoring be the responsibility of the regulator, but undertaken by an independent third party, and funded by industry (***Rec 9.4***)
- That all monitoring results should be published online on a continuous basis in real time (***Rec 9.5***)
- That once emission concentration limits are exceeded, 'make good' provisions are immediately implemented by industry (***Rec 9.6***)

Abandoned Wells

- The evidence is mixed. Decommissioned wells mostly have lower CH_4 emissions than wells that have been abandoned with wellhead infrastructure left above the surface
- Implement decommissioned wells (wells that have been cut-off, sealed (plugged) and then buried under soil)
- Need to improve the integrity performance of decommissioned wells over 1,000+ years
- Fugitive methane emissions from any onshore shale gas industry in the NT (for 1,000 decommissioned wells) represents 0.7% of Australia's inventory fugitive methane emissions and 0.005% of the global anthropogenic methane emissions from fossil fuels
- The assessed risk of fugitive methane emissions, without any further mitigation, is 'medium'

Conclusion

The Panel has formed the view that:

- The application of mitigation measures, including US New Source Performance Standards, methane monitoring and reporting, well decommissioning, and the regulatory mitigation measures in Table 9.10 (***Rec 9.7***) will give lower levels of emissions of methane and GHG

- Collectively, these measures are considered to achieve an acceptable risk for methane and GHG emissions from any new onshore shale gas field in the NT

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Chapter 10
Public Health

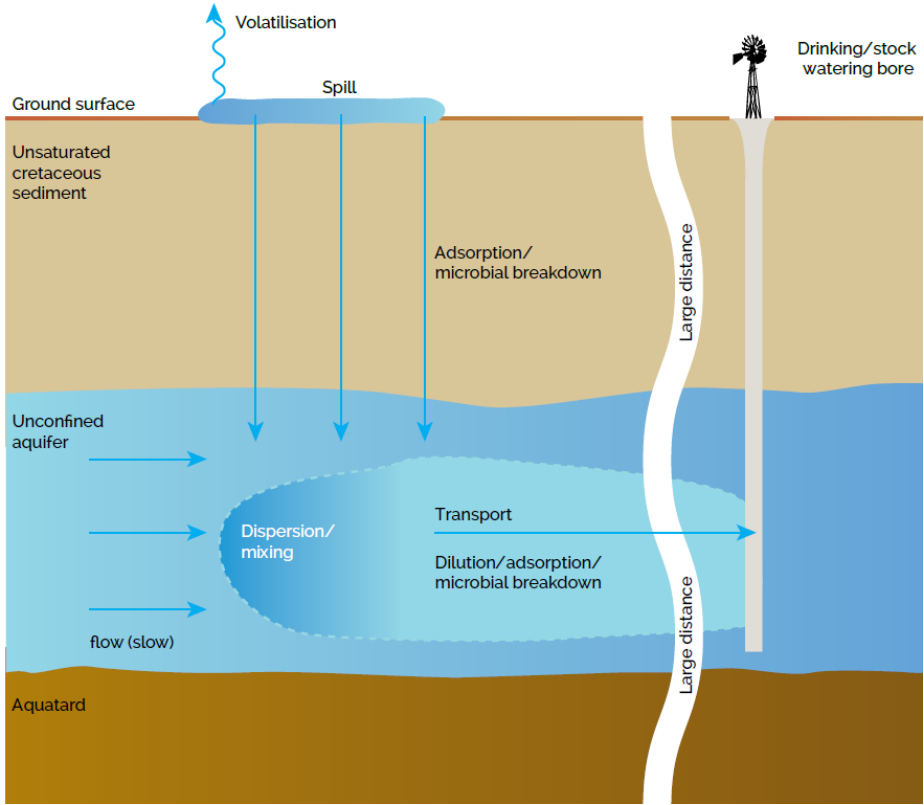
Two main approaches in draft Final Report

- First, addressed potential risks posed by chemicals released from fracking fluids and flowback water by requiring formal site-specific Human Health Risk Assessments (**HHRA**) (***Rec 10.1***)
  - methods based on enHealth and NCRA guidance
  - mandate as part of EIS requirements
  - including more information on chemicals used and emitted; and treatment/disposal of flowback and produced water (***Rec 10.2***)

- Second, addressed risks to well-being and amenity
  - issues identified along with possible measures to mitigate risk

HHRA processes for released chemicals

- Identify chemicals of concern:
  - in HF fluids; in flowback water from deep rocks; in dusts and vapours
- Exposure pathways:
  - are people in the vicinity* likely to be exposed to contaminated water, dusts, or airborne gases and vapours
- Will these chemical exposures be harmful?
  - contrast predicted exposures with health-based guidance value



** U.S. experience and other reports (e.g. experience from CSG operations in Qld and NSW) suggest proximity to wells a significant factor in mitigating health risks*

Assessed chemical risks

- HHRA reports produced so far suggest health impacts likely to be negligible with adequate controls over well integrity, fluid and chemical storage and waste disposal:
  - although reports to date have limited information on off-site risks because these pathways have been considered 'incomplete – i.e. no likely human exposures

- Off-site health risks more likely to be associated with airborne gases, vapours and dusts:
  - distance from the emission site important
  - the Panel has recommended appropriate 'set-back' distances (***Rec 10.3***)

Assessed effects on well-being and amenity

- Stress associated with negotiating land access, impacts on property values
- Noise, dust, other ‘nuisances’ and impacts of increased road traffic
- Impacts on Aboriginal culture
- Magnitude and health impacts of these risks likely to be dependent on the scale of exploratory/production phases of any gas fields
- Strategic regional environmental and baseline assessment (**SREBA**) an important tool to assess whether shale gas field developments have contributed to any increased health impacts (***Rec 15.1***)

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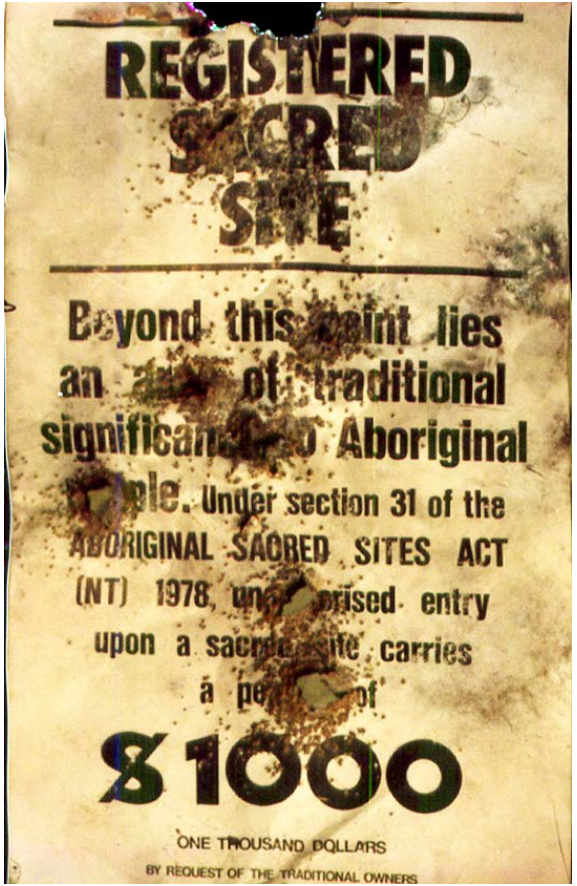
Chapter 11
Aboriginal People and Their Culture

Aboriginal people and their culture

- Aboriginal people live and are the traditional owners of land where shale gas is likely to be located
- Aboriginal people must be able to maintain their culture so that their ownership rights continue
- If the landscape suffers, so will Aboriginal people
- The potential impacts (both good and bad) of any onshore shale gas industry on Aboriginal people and their communities must be fully explained before development starts
- A plan to manage these impacts must be put in place before development starts
- Aboriginal people must be involved in the design and implementation of this plan

The draft Final Report recommends that:

- Laws and systems to protect culturally significant places be strengthened (***Recs 11.5*** and ***11.3***)
- Sacred sites legislation be amended to protect underground sites (***Rec 11.3***)
- Gas companies be required to obtain Authority Certificates and lodge applications early in the assessment/approval process (***Rec 11.2***)
- That interpreters must be used at all consultations with Aboriginal people (***Rec 11.5***)
- That a comprehensive assessment of the cultural impact of any shale gas development must be completed prior to the grant of a production licence (***Rec 11.8***)
- That the Government consults and collaborates with Land Councils to ensure that reliable, accessible and accurate information about any shale gas developments is effectively communicated to Aboriginal people (**Rec 11.6**)



- That gas companies must provide Aboriginal people with comprehensive information about proposed developments on all land (***Rec 11.6***)
- That the Government, gas companies, Land Councils and traditional owners must make exploration agreements publically available where appropriate (***Rec 11.7***)

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Chapter 12
Social Impacts

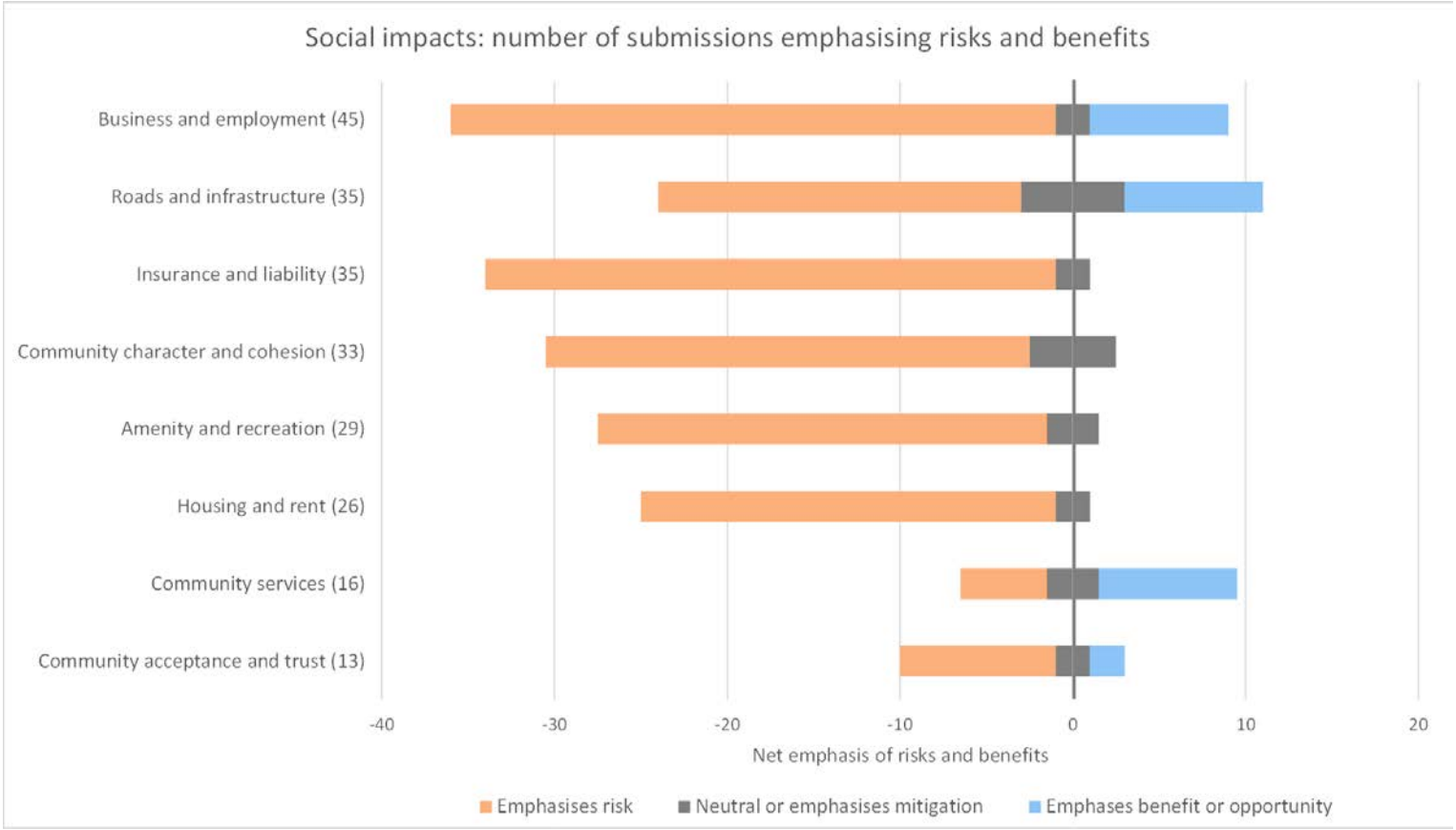
Definitions

- **Social impacts**: “any change that arises from new developments and infrastructure projects, that positively or negatively influence the preferences, wellbeing, behaviour or perception of individuals, groups, social categories and society in general”
- **Cumulative impacts**: combined impacts arising from multiple projects occurring at one time
- **Social licence to operate**: community acceptance or approval of a project, company or industry. Hard to earn but easily lost

Coffey reports - what is/is not included

- We asked Coffey to design a social impact assessment framework is shale gas development were to occur in the NT.
- We did not ask Coffey to determine is this industry had a social licence to operate in the NT. Rather, it was assumed for the purpose of the exercise that it did not.
- Coffey, together with IAS, consulted with communities. Those communities indicated to Coffey that they believed that any shale gas industry would bring significantly more risks that benefits
- Coffey published three reports (and a summary report):
  - a leading practice social impact assessment (**SIA**) framework with the University of Queensland, Centre for Social Responsibility in Mining
  - a report discussing the concept of a social licence to operate and its application to NT onshore shale gas, in conjunction with CSIRO
  - a SIA study of the Beetaloo Basin to identify likely risks and benefits of such an industry, making recommendations to manage and mitigate those risks

Coffey - number of submissions emphasising risks and benefits



Why is an SIA important?

An SIA Framework must:

- identify and respond to impacts that occur across different stages of development
- account for a lack in statistical social and economic data in remote and Aboriginal communities
- be culturally sensitive
- identify strategies to maximise benefits and minimise disturbances that are aligned with the needs and aspirations of affected stakeholders

An SIA Framework should:

- inform a more strategic and collaborative approach to development of the region and engage affected individuals and communities in identifying and managing the impacts without placing undue burden on them

Likely affected communities

- **Urban** – Katherine (town) and Tennant Creek
- **Rural North** - Barunga, Beswick, Mataranka, Jilkminggan, Minyerri and Ngukurr
- **Rural Central** - Larrimah, Daly Waters, Dunmarra, Newcastle Waters and Elliott
- **Rural East** - Borroloola and Robinson River

* Indicates a community visited as part of the baseline study

Stakeholder category	No. of meetings	%
Government agencies and statutory authorities	7	10
Businesses and peak business organisations	11	16
Local Governments	6	9
Non-government organisations	6	9
Community organisations and residents	39	56

Potential threats to communities that were identified by those communities

- Increased risk of road accidents from construction and operations traffic, particularly heavy vehicles during the construction phase
- Increased levels of anxiety for sub-basin residents over potential risks to groundwater resources
- A perception that industry development approval is against majority community wishes, contributing to a weakening in trust in the Government
- The potential for higher wages to affect local businesses on-going conflict between supporters and opponents of unconventional gas development
- Heightened divisions in Aboriginal communities driven by perceived inequity in the receipt of royalties
- Heightened perceptions of cultural loss due to perceived impacts to water resources, and uncertainty about the ultimate scale of industry development and landscape alteration
- The potential for reduced investment in pastoral and horticultural operations due to uncertainty over the long-term sustainability of groundwater resources

Coffey - key recommendations

- That a strategic regional baseline assessment is required to enable a comprehensive Sub-basin wide baseline from which project-level and cumulative impacts can be identified, assessed and managed
- That the comprehensive baseline assessment must be informed by independently-led project-independent studies that are participatory
- That mitigation strategies and management measures must be developed through collaboration between the Government and local government, industry, Land Councils and communities

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Chapter 13
Economic Impacts

Economic Impacts

- The Inquiry engaged ACIL Allen (**ACIL**) to look at the economic benefits and risks of fracking
- ACIL used its economic and financial modelling expertise to predict how much economic growth and how many jobs the gas industry might create for the NT
- ACIL had to make many assumptions to build the model because information about the onshore shale gas resource is limited and there is currently no development proposal
- Therefore, there is a high degree of uncertainty in the modelling
- The Inquiry made it clear that ACIL was to adopt a very conservative set of assumptions so as not to overstate any potential benefits
- ACIL was not asked to provide a commercial assessment of viability of any onshore shale gas industry

Five development scenarios modelled

- ACIL modelled how the economy will look under five different scenarios:
    - Baseline – what the economy looks like if there is a permanent ban on fracking
    - Shale Calm – if there is exploration work only
    - Shale Breeze – if there is a small scale development (103 wells)
    - Shale Wind – if there is a medium development (167 wells)
    - Shale Gale – if there is a large scale development (670 wells – *this is approximately ½ of the industry estimate of 1000-1200 wells*)
- It is not possible to say which, if any, of these scenarios will eventuate at this stage

Assumptions

- The table below compares the assumptions made by ACIL and Deloitte
- ACIL's assumptions were more conservative, which therefore gives more conservative outputs

Item	Deloitte		ACIL		
Case	**Aspirational**	**Success**	**Breeze**	**Wind**	**Gale**
Volume of gas (PJ/annum)	586	910	37	108	365
CAPEX ($m per well)	6 - 10		19	16	13
OPEX ($ per GJ)	0.5 - 0.9		1.8	1.6	1.5
Wellhead costs ($ per GJ)	1.9 - 2.7		6	5	4

Real income

- Real income is a measure of "*the welfare of residents in an economy and their ability to purchase goods and services and to accumulate wealth*"

- ACIL modelled the increase in real income over 25 years for each of the development scenarios:

  - Permanent moratorium – no additional income
  - Exploration only – $35 million
  - Small development – $937 million
  - Medium development – $2.8 billion
  - Large development – $5.8 billion

- These are estimates only

Jobs

- ACIL modelled how many new jobs there will be for each development scenario

- The numbers below are the estimated average number of jobs there will be in any year over 25 years:

    - Permanent ban – no additional jobs
    - Exploration only – 5 jobs
    - Small development – 82 jobs
    - Medium development – 252 jobs
    - Large development – 524 jobs

- These are estimates only

Population growth

- ACIL modelled the population increase for each development scenario. There is current a net negative population growth for the NT

- The numbers below are the average number of people there will be in the NT as the result of the shale gas industry at any time over 25 years:

  - Permanent ban – no more people
  - Exploration only – 10 more people
  - Small development – 195 more people
  - Medium development – 595 more people
  - Large development – 1,240 more people

- These are estimates only

Recommendations

- That the Government must ensure that the regions impacted by the industry benefit from any royalties received by Government (***Rec 13.1***)
- That early planning is important to make sure that any jobs and business opportunities for local people (not FIFO) are maximised (***Rec 13.2 – 13.8***)
- That any adverse impacts on other industries (including other industries that use groundwater) must be identified and mitigated early in the development process (***Rec 13.9***)

SCIENTIFIC INQUIRY INTO
HYDRAULIC FRACTURING
IN THE NORTHERN TERRITORY

Chapter 14
Regulatory Reform

Making land available for onshore shale gas exploration

Minister for Resources decides which land to release

May take into account land release policy (not required to)

→

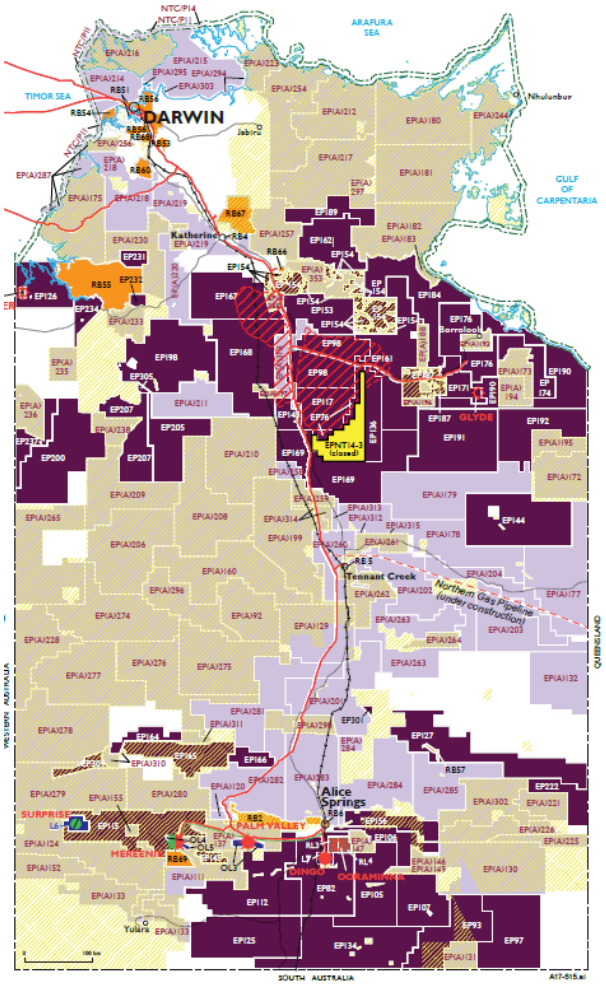
Minister for Resources publishes a notice inviting applications in relation to that land

Petroleum Act, s 16

→

Companies apply for exploration permits in relation to that land

Petroleum Act, s 16



Making land available for onshore shale gas exploration

- The decision about which land to make available for shale gas exploration must be more transparent, consultative and accountable
- The community must be given an opportunity to comment on any land release (***Rec 14.2***)
- The Minister must be made to consider whether any onshore shale gas industry can coexist with other current and future land uses (***Rec 14.2***)
- Certain land should be 'no go zones' and never be available for exploration (***Rec 14.4***). For example:
    - areas of high tourism value
    - residential areas
    - national parks
    - conservation reserves
    - areas of high ecological significance
    - areas of cultural significance, including sacred sites
    - areas of agricultural value

Improved decision-making

- The Panel has made recommendations to increase the transparency and accountability of decision-making processes, and the quality of the decision-making in relation to the granting of permits, environment management plans, and other decisions under the *Petroleum Act*. For example, the:
  - requirement to apply the principles of ESD, including the precautionary principle (***Rec 14.10***)
  - requirement that a gas company is a 'fit and proper person' to hold a licence including, for example, its history of compliance with environmental regulation both domestically and overseas (including related companies) (***Recs 14.11*** and ***14.18***)
  - mandatory publication of reasons for decisions (***Recs 14.2*** and ***14.11***)
  - providing opportunities for public comment, including on draft environment management plans (***Recs 14.9*** and ***14.14***)
  - allowing the public an opportunity to challenge decisions in court or in a tribunal by way of judicial and merits review ('open standing')(***Recs 14.21, 14.22*** and ***14.23***)
  - requirement to consider cumulative impacts of production, for instance through 'area-based' regulation (***Recs 14.19*** and ***14.20***)

Objective-based regulation, minimum standards and enforceable codes of practice

- The Panel has recommended that any objective-based regulatory framework be supported by clear, prescriptive and enforceable codes of practice in relation to well construction and testing, well abandonment, road and pipeline construction, and the monitoring and reporting of methane emissions (***Rec 14.17***)
- The *Schedule of Onshore Exploration and Production Requirements* is not enforceable. It must be repealed and replaced by legislation to regulate seismic surveys, drilling, hydraulic fracturing, and well abandonment prior to the grant of any production licence (***Rec 14.16***)

Improved financial assurances

- The present system of bonds and securities for rehabilitation is inadequate and opaque
- The Panel has recommended that leading practice financial assurance regimes be implemented that include:
  - environmental rehabilitation bonds that accurately reflect the cost of rehabilitation and that are calculated transparently (***Rec 14.12***)
  - a non-refundable 'orphan well' levy to ensure that funds are available for the long term monitoring of wells and, if required, their management and rehabilitation (***Rec 14.13***)

Compliance and enforcement

- The laws are currently weak in respect of compliance and enforcement and must be strengthened (***Rec 14.27***)
- Fines and other sanctions (jail of company directors and revocation of permits and licences) must be increased so that non-compliance does not become a mere cost of doing business (***Rec 14.30***)
- The Government must implement a transparent compliance system where non-compliance is made publically available and that the public is aware of what activities are and are not permitted by gas companies (***Rec 14.24***)
- Civil enforcement actions ought to be permitted by the public where there is non-compliance by a gas company (***Rec 14.28***)
- There should be a reversal of the onus of proof so that gas companies must prove that they did not cause any environmental harm by their actions (***Rec 14.29***)

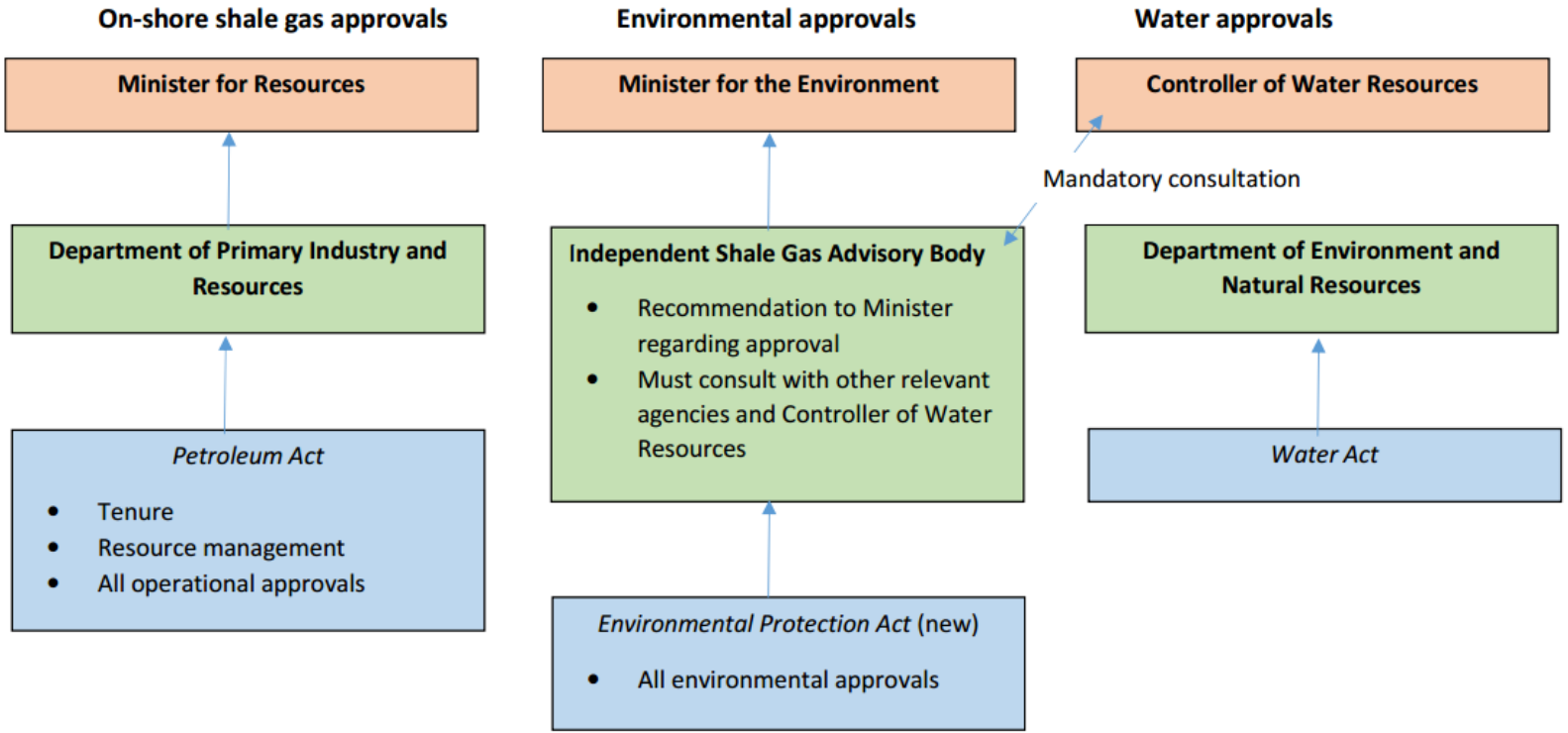
Pastoral land

- The current regime does not adequately balance the rights and interests of gas companies and pastoralists or facilitate the making of appropriate and fair agreements between them. This can lead to a proven imbalance
- The Panel has not recommended a veto, but has recommended that there be mandated statutory land access agreement place before gas companies can obtain access to pastoral land. Currently there is no requirement (***Rec 14.5***)
- Breach of the land access agreement is a breach of any approval to carry out activity on that land (***Rec 14.5***)
- In addition to any terms negotiated between the pastoralist and the gas company, the statutory land access agreement must contain standard minimum protections for pastoralists (***Rec 14.6***). For example, a requirement to notify the pastoralist of all spills, make good provisions in respect of water and indemnification for all damage
- The Government must implement a mandatory minimum compensation scheme for pastoralists (***Rec 14.7***)

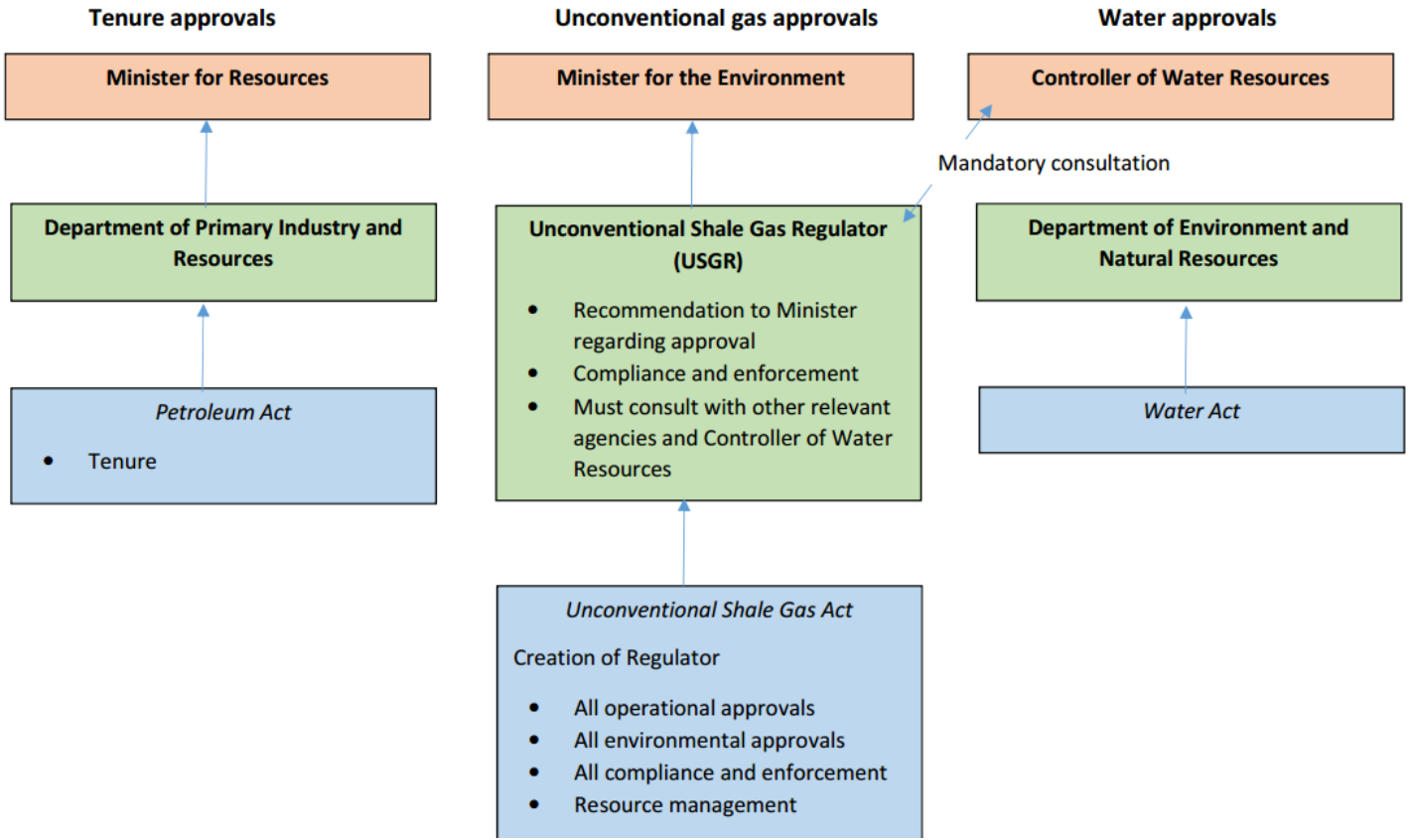
Reform of the regulator

- There is widespread lack of confidence in the regulator (DPIR), including in relation to:
  - resourcing
  - capacity
  - independence
  - its ability and/or willingness to carry out effective compliance and enforcement.
- Panel recommendations to mitigate these risks include:
  - implementation of a full cost recovery system where fees paid by the gas industry cover the costs of regulating the industry (***Rec 14.1***)
  - there must be a clear separation between the agency with responsibility for regulating (compliance and enforcement) any onshore shale gas industry and the agency responsible for promoting that industry (**Rec 14.31**)
- There are two options for a new regulator:
  - **Option 1 -** a separate environmental approval
  - **Option 2 -** establish an unconventional shale gas regulator

Option 1 – an independent environmental approval



Option 2 – establish a separate and independent regulator



Have Your Say

Anyone wishing to make a comment or provide a submission to the Inquiry is encouraged to do so but please hurry. The Final Report is being handed down in March 2018

Post:

Post your submission to

Hydraulic Fracturing Inquiry

GPO Box 4396, Darwin, NT 0801

Email:

Email your submission to

fracking.inquiry@nt.gov.au

Online:

Upload your submission to the Inquiry's 'Have Your Say' page

www.frackinginquiry.nt.gov.au