SUBMISSION TO INQUIRY INTO HYDRAULIC FRACTURING IN THE NORTHERN TERRITORY

Role of Environmental Defenders Office (NT) Inc

The Environmental Defenders Office (NT) Inc (EDO NT) is a non-profit community legal centre that advises and acts for individuals, community groups and conservation groups seeking to protect the environment in the public interest.

The EDO NT also provides education and information in the form of factsheets, tool kits seminars and alerts.

The mission of EDO NT is:

To maximise the community's use of existing legal avenues to protect the environment of the Northern Territory, and to seek reform of law and policy to ensure improved environmental outcomes.

The goals of the EDONT are:

1. To provide high quality legal advice on matters of public interest environmental law with a specific focus on issues relating to mining, water, pollution of oceans and rivers, environmental impact assessments and matters of national environmental significance;

2. To provide access to justice by being the first port of call for communities, community groups and individuals (especially Indigenous Territorians) when faced with environmental concerns which are a matter of public interest;

3. To educate the community of the Northern Territory on matters of environmental law.

The EDO NT is part of an Australia wide network of Environmental Defenders Offices (ANEDO). This submission draws on the experience and submissions of ANEDO.

Introductory comments

Because of the manner in which shale gas is produced it has the potential to impact on the landscape, on ecosystems, on surface and groundwater, on the atmosphere, on communities, and rarely may result in minor induced seismicity. It will be vital for industry and government to recognise the complexity of the challenges posed by these possible impacts. However, most can be minimised where an effective regulatory system and best monitoring practice are in place and can be remediated where they do occur. If the shale gas industry is to earn and retain the social licence to operate, it is a matter of some urgency to have such a transparent, adaptive and effective regulatory system in place and implemented, backed by best practice monitoring in addition to credible and high quality baseline surveys. Research into Australia's deep sedimentary basins and related landscapes, water resources and ecosystems, and how they can be monitored, will be essential

to ensure that any shale gas production is effectively managed and the impacts minimised[1]*.*

The submission of the EDO NT has been structured as follows:

Firstly, we make submissions on the legal framework that governs exploration and production of petroleum resources in the NT. These submissions apply to the Terms of Reference generally and specifically as regards methods of mitigating potential environmental impacts.

We then make submissions regarding consultation, consent and social license, based on the experience of our clients.

Finally the submission makes comment against some specific Terms of Reference.

Part 1 - The Law

Current legal framework

The current legislation regulating Petroleum activity comprises:

- *Petroleum Act*
- *Petroleum Regulations*

Although the Department of Mines and Energy refers to the *Schedule of Onshore Petroleum Exploration and Production Requirements 2012* as regulations, their legal status is uncertain, and they appear to operate as guidelines only.

The Department of Mines and Energy describes its current regulatory regime as:

The Northern Territory petroleum legislation is now continuing to provide leading practices in regulating petroleum activities as one of the most contemporary legislative regimes in Australia, promoting safe and environmentally appropriate petroleum exploration.

The EDO NT does not agree with this assessment.

The *Petroleum Act* commenced in 1984 and has not been comprehensively reviewed since then.

The *Petroleum Act* has been drafted to fit the model of conventional petroleum exploration, appraisal and development. Shale gas exploration, appraisal and development requires different stages as a result of the particular techniques used for the appraisal of the resource and production

[1] Engineering Energy: Unconventional Gas Production – Report by the Australian Council of Learned Academies for PMSEIC, June 2013

http://www.chiefscientist.gov.au/wp-content/uploads/shalegas-recommendationsFINAL.pdf

and the hydraulic fracturing and the drilling of multiple wells.

Compared to the legislation in other jurisdictions, it is lacking in several areas, including:

- No fit and proper person consideration[2]
- No potential for objection to issuing a production license by other Government agencies or by local Councils[3]
- No mandated environmental assessment by a separate agency, e.g. Environmental Protection Agency or Development Consent Authority and attendant rights of third party objection and hearing[4]
- Access arrangements between the land holder and the proponent are not regulated by the Act[5]
- Save for an objective in clause 3(f), the Act contains no requirement to consider the protection of natural resources in the form of flaura, fauna, fish, fisheries and scenic attractions, or features of Aboriginal, architectural, archeological, historical or geological significance is required by decision makers under the Act[6].
- The Act does not specifically provide for conditions aimed at protecting the environment[7]
- Compensation for landowners does not extend to damage to trees, grasses or other vegetation on land or destruction or loss of, or injury to, or disturbance of, or interference with, stock on land, damage consequential on any matter[8].

Most provisions of the *Water Act* do not apply to mining or petroleum activity - including the prohibition on obstruction of a waterway and pollution of water outside a mining or petroleum site; and on taking or extracting water.

The *Waste Management and Pollution Control Act* (the Waste Act) does not apply to mining or petroleum activities where a contaminant or waste is confined within the land on which the activity is being carried out.

The *Environmental Assessment Act* (the EA Act) applies to "each matter affecting the environment which is, in the opinion of the NT EPA, a matter which could reasonably be considered to be capable of having a significant effect on the environment". The focus is on individual projects, and EDO NT submits the cumulative effect of the hydraulic fracturing process should be considered.

The Minister for Mines and Energy is obliged to advise the Environmental

[2] for example see s24A Petroleum (Onshore) Act 1991 NSW

[3] for example see Part 4 Petroleum (Onshore) Act 1991 NSW

[4] for example see Part 4 Petroleum (Onshore) Act 1991 NSW

[5] see Part 4A Petroleum (Onshore) Act 1991 NSW

[6] compare Part 6 Petroleum (Onshore) Act 1991 NSW

[7] see Part 6 Petroleum (Onshore) Act 1991 NSW

[8] see Part 11 Petroleum (Onshore) Act 1991 NSW

Protection Authority (EPA) of all applications so that an assessment can be made as to its effect on the environment.

EDO NT reports a low confidence level in the reporting arrangements as between Ministers and agencies. EDO NT also ahs low confidence in the regulatory capacity of the Department of Mines and Energy

EDO NT refers the Commissioner to the funding of the EPA in its report on the Environmental Assessment and Regulation of Mine Sites[9]. In this report the EPA found that:

- The environmental impact assessments failed to provide sufficient information to enable an adequate assessment of risks.
- Environmental Management Plans and Mine Management Plans are used to gather information that was actually needed to inform an approval decision.
- Assessment of the Redbank project did not consider the environmental risks associated with the project not proceeding as scheduled.
- Repeated failures to meet environmental monitoring and reporting requirements and respond to formal directions given by a Mining Officer.
- Limited public reporting on compliance with approvals.
- Mining allowed to commence without an approved Environmental Management Plan.
- Mining Management Plans for care and maintenance and waste discharge licenses have done little to fix problems at site and the surrounding environment
- No enforcement action was undertaken by regulators against operators for environmental harm or breaches of approvals.

Whilst the report is based on a case study of one legacy mine, the findings apply to some degree across the Northern Territory. The EPA makes the observation that the case demonstrates the risks involved in relying on a weak approvals system to resolve issues outstanding from an inadequate environmental assessment.

The *Petroleum Act* does not allow for sufficient or adequate notice of applications, for third party submission or for appeal and review rights. These are all factors supporting an open accountable regulatory regime and contributing to confidence in regulators.

Legislation Review – Dr Tina Hunter

[9] NT EPA Recommendations on the Environmental Assessment and Regulation of Mine Sites, March 2014

http://www.ntepa.nt.gov.au/__data/assets/pdf_file/0019/351262/recommendations_environment_assess_mine_sites.pdf

Dr Tina Hunter was engaged by the Northern Territory Government in 2012 to conduct a review of the Northern Territory onshore petroleum legislation. She was charged specifically with reviewing the capacity of the current legal framework to regulate the development of onshore shale, tight and coal seam gas[10].

Dr Hunter has analysed petroleum laws in numerous jurisdictions, and drafted legislation for Australian and international governments. Dr Hunter made 26 recommendations and the Department of Mines and Energy has recently updated the table of recommendations, initial responses and progress. The latest chart is attached to this submission.

The Government agreed with 14 recommendations, agreed in part with 2 and in principle with 2 recommendations. The Government noted the other recommendations and supported one of those.

The EDO NT agrees with Dr Hunter's recommendations and makes the following observations and recommendations about the Government response and progress report on those recommendations to which it has not agreed in full.

Recommendation 2

Given the unique climate, landforms and biodiversity of the NT, preservation of these natural features of the NT should be afforded complete environmental protection to ensure that these unique landscapes are preserved and maintained.

This recommendation calls for complete environmental protection, however the Government has merely noted this recommendation and relies on its current environmental assessment regime in response.

The EDO NT submits the current assessment regime is insufficient to afford protection and current regulatory provisions and oversight are inadequate.

Recommendation 4

Given the importance of water for NT cattle grazing enterprises and indigenous populations, the NT Government should embark on establishing underground water resources baseline data prior to unconventional gas resource activities. Further, during and after the development of these resources, groundwater monitoring should continue to ensure underground water resources are not polluted by these activities.

[10] NT Department of Mines and Energy website

http://www.nt.gov.au/d/Minerals_Energy/index.cfm?header=Legislation%20Review%20-%20Petroleum&newscat1=&newscat2=

The recommendation calls for establishment of baseline data before, during and after unconventional gas activities, however the Government has accepted the recommendation part, and relies on the operator to collect and report baseline data.

The EDO NT submits that independence of collection of baseline data and access by the public to that data is critical. The EDO NT seeks input to the development of regulatory provisions regarding use, monitoring and pollution of water resources in hydraulic fracturing processes.

Recommendation 6

The development of unconventional gas resources in the Northern Territory should necessarily include detailed infrastructure planning and analysis prior to the development of large-scale production operations. This planning should necessarily consider the geographical features of the Darwin Peninsula, and plan for considerable expansion of petroleum transport and processing facilities.

The recommendation calls for detailed infrastructure planning. The Government noted this requires a whole of government approach and advises it is currently undertaking some planning activity.

The EDO NT submits that the articulated activities are insufficient in the face of a rapidly developing industry.

The EDO NT supports the Strategic Regional Land Use policy package adopted by the New South Wales Government [11]and recommends that a similar process be adopted in the Northern Territory. The package comprises strategic regional land use plans, aquifer interference policy, and Codes of Practice for well integrity and fracturing. Plans identify and map strategic agricultural land and identify the petroleum and mineral potential of the region.

They also analyse the region in terms of infrastructure, economic development and employment, housing and settlement, community health and amenity, the natural environment, natural hazards and climate change, and cultural heritage. For each of these matters, the plan identifies challenges and provides a policy response.

Recommendation 14

The environmental protection regulatory framework for petroleum should be reviewed. Regard should be given to implementation of a separate, overarching environmental protection act, or the application of current water, waste management and pollution control legislation to petroleum activities.

[11] http://www.nsw.gov.au/initiative/strategic-regional-land-use

This recommendation calls for water, waste management and pollution control legislation to form part of an overall environmental control regime applying to petroleum activities. The Government advises it has completed a review of environmental legislation in the NT and works with the EPA. It also advises Environment Regulations are currently being drafted.

The EDO NT submits this response is inadequate. It is necessary that the *Water Act* and *Waste Management Pollution Control Act* apply to petroleum and all mining activities in the NT.

Recommendation 15

Regulation of petroleum resources management and the environment should be split within the NT DoR. One agency should be responsible for environmental assessment in relation to onshore petroleum resource activities.

This recommendation calls for a separation of regulation of environmental matters from Department of Mines and Energy and a separate agency be responsible for environmental assessment. The Government response is to create a separate team within the Energy Directorate, and to refer applications to the NTEPA and consult with Land Resource Management.

EDO NT submits that complete separation of environmental assessment and regulatory oversight from the Department of Mines and Energy is the only satisfactory response to this recommendation. The EDO NT refers to the NT EPA findings regarding Redbank Mine[12], which made critical findings about the inadequacy of environmental regulatory oversight of mining by Department of Mines and Energy. Of particular relevance, the following quote at page 5.

Government agencies may have been challenged by the tension that can exist between supporting development and ensuring appropriate environmental management, and agencies have operated with little strategic guidance on how best to achieve an appropriate economic and environmental balance.

Recommendation 18

The process for the allocation and regulation of water resources in the Northern Territory should be reviewed. Legislative provisions rather than soft law provisions should be adopted for water resource allocations to all users,

[12] NT EPA Recommendations on the Environmental Assessment and Regulation of Mine Sites, March 2014

http://www.ntepa.nt.gov.au/__data/assets/pdf_file/0019/351262/recommendations_environment_assess_mine_sites.pdf

including those undertaking petroleum or mining operations, to ensure that all stakeholders have adequate and equitable access to water resources.

This recommendation requires the inclusion of mining and petroleum activities within the water allocation framework and regulated by the *Water Act*. Despite an initial response of 'noted' the progress report advises that all petroleum activities will be regulated under the *Water Act* and the *Waste Management Pollution Control Act*.

The EDO NT welcomes this decision, and notes it is somewhat at odds with the response and progress report under Recommendations 14, 19 and 20.

Recommendation 24

The NT DoR should develop a Land Access Code for landholders. Preferably, the Land Access Code should be modelled on the existing Queensland Code.

This recommendation specifically advises on a land access code. The Government responds that it is currently supporting a model access and compensation agreement to be co-badges by APPEA and the NTCA.

The EDO NT submits that it is not appropriate or sufficient to rely on a model agreement with legislative support and that provisions regulating land access and compensation should be included in Petroleum legislation and a Code of Practice developed with legal force[13]. Further, operators should be required to fund legal advice for land owners to assist with negotiating a land access agreement[14].

EDO NT refers the Commissioner to Codes of Practice for Land Access in New South Wales and Queensland.

Recommendation 26

The NT DoR should consider land use activities in the grant of petroleum titles, and that land use reservations should be adopted where appropriate.

This recommendation calls for greater attention to land use when granting petroleum titles.

EDO NT submits that Government must recognize that in some cases, petroleum and mining activity will be incompatible with existing or preferred land uses, because one land use erodes the values of the other land use – as planning experts and NRM scientists have noted elsewhere. For example, exploration and mining should be permanently excluded from recognised

[13] See Part 4A, Petroleum (Onshore) Act NSW 1991

[14] see s69D (2A) of the Petroleum (Onshore) Act NSW 1991

national parks and conservation areas; sensitive cultural areas; as well as residential areas and important agricultural areas.

Specific issues

Water

The Northern Territory community has expressed concern about the way water is managed, allocated, monitored and accessed.

The need to consider the unconventional gas industry as a whole system, from exploration to production and infrastructure development right through to decommissioning and long-term management of orphaned wells and infrastructure. this demands a whole of the water and waste management cycles view and an evaluation as to how all stages of the industry impact on water resources, competing land uses and community enterprises.

Water used by mining and petroleum activities is not considered in water allocation planning and fears of over allocation due to resource-based activity is real.

Hydraulic fracturing uses a lot of water and it is imperative that this use should be licensed, monitored, and regulated under the *Water Act*. Similarly, the *Waste Management and Pollution Control Act* should apply to mining and petroleum activities. EDO NT does not understand how the wastewater from hydraulic fracturing processes in the NT can be dealt with effectively and safely. The economic burden of transporting wastewater from remote wells to safe storage facilities is sure to be high.

Access to Justice

The need for public participation has been recognised and proclaimed as a vital part of the development process in international, national and state instruments.(Aarhus Convention, Rio Declaration)

Legislation should be amended to explicitly require adequate community participation in decision-making that will impact upon the environment, the health and well being of the community and the use of natural resources.

Further, all information relating to environmental assessment and decision-making should be made publicly available, for example, information on Government websites.

The most common process by which the public can participate in decision-making regarding proposed developments is through Environmental Impact Assessment (EIA). EIA ensures that all stakeholders can be involved in the assessment of a proposed project prior to any final decision being reached.

EIA requires decision makers to take both long and short-term impacts of development into account and as well identify where monitoring programs may be necessary, and how the impacts of the development (if approved) can be managed into the future.

EIA processes should also allow both written and oral submissions, thereby allowing the widest section of society to be involved.

Legislation should provide for third party merits review, judicial review and open standing for enforcement proceedings.

Recommended legal framework

The following recommendations identify the features of a best practice legal framework for regulating petroleum activity in the Northern Territory

1. The laws that regulate exploration for petroleum and petroleum production should aim to achieve **ecologically sustainable development (ESD)**; and decision makers must exercise their functions and powers consistently with ESD principles. 'ESD' integrates environmental, social and economic factors into decision-making.

The absence of guiding objects, or references to ESD in the *Petroleum Act (NT)*, means that decision makers considering licensing are unlikely to make decisions on the basis of ESD principles or triple bottom line outcomes. There are no linkages to objective environmental criteria to guide discretionary considerations, and no requirement to apply ESD principles in making decisions or exercising powers under relevant NT legislation.

2. NT laws should **improve environmental impact assessment (EIA)** to meet world's leading practice.

This should include:

- improving the **independence and rigour** of project assessment and approval;
- Minimise discretionary decision-making unless it is linked to clear criteria and accountability mechanisms.
- adopting a **catchment-wide approach to assess cumulative impacts and safe environmental limits**[15] – in relation to water, biodiversity, native vegetation, soil and air quality (including public health considerations), and greenhouse gas emissions;
- mandatory assessment of the **climate change impacts** of proposed projects (from mitigation and adaptation perspectives), with specific conditions to address these;

[15] Noting that cumulative impacts extend beyond petroleum to other mining, agriculture and other impacts.

- funding independent scientific assessment of unconventional gas lifecycle **greenhouse gas emissions** (including fugitive emissions) and its potential to contribute to or mitigate climate change;
- **effective oversight and quality assurance of EIA** – including better offences and penalties for inaccurate or incomplete information; audits and enforcement; and clear regulatory responsibilities;
- adopting sophisticated, 'triple bottom line' **costs benefit analysis, not economic impact analysis** – so that the adverse environmental, economic and social impacts of unconventional gas projects and development are considered as well as economic activity and benefits

3. NT laws must be fairer to local communities, by **improved notification, education, public participation, appeal and compensation rights.**

This should include:

- comprehensive and mandatory rights to **public access to information, notification and consultation** at all stages (licensing, environmental assessment, approval and post-approval), including for major projects;
- **enshrining appropriate rights and obligations in the law** itself. This promotes certainty, transparency, accountability and public confidence. Setting out such processes in policies or guidelines alone risks uncertainty (because they are easy to change), 'practical obscurity' (where obligations are hard to find), and non-compliance (because they are harder to enforce).
- improving trust and accountability through community rights for **merit appeals, judicial review, and 'open standing'** for enforcement proceedings, including for major projects;
- consultation with **Indigenous communities** to identify and implement leading practices for tailored engagement strategies and cultural heritage protection;
- establishing a robust, equitable and transparent **compensation regime** for affected stakeholders, in addition to comprehensive environmental management;

4. Relevant laws should ensure effective **strategic planning**.

Leading practices for strategic planning should:

- **engage and listen to communities**, and present a range of options and consequences for communities to deliberate on;
- **properly value environmental assets**, and the ecological services and social benefits they provide – as an integral part of 'triple bottom line' outcomes;

- **protect areas of high conservation value and key agricultural lands** from all mining activities, as part of a balanced to resolving land use disputes and achieving ESD;
- **integrate decisions** on mining with regional, territory and federal NRM targets.
- **protect communities** by providing minimum restricted areas around communities where unconventional gas extraction or related infrastructure may not occur

5. To improve compliance, regulatory systems need to ensure more widespread and effective **monitoring, enforcement and reporting**.

This would include:

- practical steps to **measure, share and analyse environmental data**;
- **accurate, transparent and publicly accessible** information, pre- and post-approval;
- shared commitment from industry and government to **fund improved monitoring and enforcement** – as a necessity of doing business safely and responsibly;
- conditions of consent granted must attach **monitoring programs before the commencement of projects**. Among other things, lack of baseline monitoring makes it even harder to prove causation when an accident does occur. Proving causation and assigning responsibility can be further muddied when companies merge or projects are on-sold, as frequently occurs. Such problems have led to calls for **greater use of the precautionary principle** to deal with uncertainty around mining impacts. This may include, where appropriate, placing the **'burden of proof' on proponents** to prove their activities are safe; or on those who deny responsibility for particular environmental impacts, to prove they did not cause them[16].
- frequent, **independent audits of compliance** with licensing conditions;
- effective **site rehabilitation** conditions, and enduring responsibility for future impacts and rehabilitation goals;
- clear lines of **enforcement responsibility**, and **accountability for performance**;
- examine and address potential or perceived **conflicts of duties** – where one agency 'promotes' the mining industries, as well as licensing, regulating and enforcing industry activities.
- Adopt a **tiered enforcement framework**, to ensure breaches of approvals and conditions result in punishment that deters misconduct. The

[16] See further The Hon B. Preston, 'Internalising Ecocentrism in Environmental Law', Speech to the 3rd Wild Law Conference, 16-18 September 2011, Griffith University, Queensland, pp 7-8.

framework should include categories of serious offences, mid-range (strict liability) offences and minor (absolute liability) offences.

- Laws should give prosecutors and courts a **wider range of innovative enforcement tools**. These tools should include orders to pay investigation costs; undertake works for environmental benefit, including fund environmental organisations; complete audits, training and financial assurances; publicise offences or notify certain people; and remove any monetary benefit of the crime.
- **Performance based laws** where the level of technical specificity is risk based.
- Increase **resourcing for relevant compliance and enforcement divisions** in order to improve rates of audits, investigations and prosecution.
- Provide the Minister with **powers to suspend or revoke approvals** for breaches of conditions. In addition, establish a process for **landowners to apply** to revoke their consent to land access if mining operations breach conditions.
- **Longer statute of limitation periods**, acknowledging the length of time for an offence to manifest.

Part 2 - Consultation, Consent and Social License

EDO NT acts for a number of traditional owners who are concerned about hydraulic fracturing on their land. They are often confused about the processes, concerned about the impacts, and distressed at the pressure to make decisions within short time frames.

Improved consultation and partnerships with Indigenous communities is consistent with the aims of national environmental law; and the UN *Declaration on the Rights of Indigenous Peoples* (which Australia has supported since 2009). The Declaration outlines rights to participate in decision-making in matters that would affect Indigenous people; and rights to conserve and protect the environment and the productive capacity of lands and resources.[17]

It also notes that States shall consult and cooperate with Indigenous peoples in good faith: 'prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development… of mineral, water or other resources'; and 'before adopting and implementing legislative or administrative measures that may affect them.'[18]

[17] United Nations *Declaration on the Rights of Indigenous Peoples* (2007), available at: www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf. See Articles 18, 23, 32.1 and 29.1 respectively.
[18] UN *Declaration on the Rights of Indigenous Peoples* (2007). See Articles 19 and 32 respectively.

There is no legal requirement for consent to mining on aboriginal land other than at the exploration stage. We are advised by our clients that consultation will often only cover issues arising at exploration stage and does not include the process of hydraulic fracturing, waste water storage, abandonment and legacy risks.

Consultation demands full disclosure and transparency and the law should require that.

For example, prospective operators should disclose fully the potential number of wells, maximum amount of water to be used and how much product water is to be stored on the land and under what circumstances. Activity levels, environmental impacts and risks during all stages of production and after abandonment should be disclosed.

Based on our clients' feedback, it is imperative to identify the correct traditional owners for the purpose of consent to activity on the land. It is important to allow for sufficient time to identify correctly those who can speak for the land.

Interpreters should be used for consultation with Traditional Owners. Our clients report that when hydrologists or other scientists attend community meetings for the purpose of giving information, it is rarely understood by Traditional Owners.

It is also important for Traditional Owners to understand / consider the impact of agreement and activity on traditional law – for example clients report they have agreed to activity which ahs subsequently impacted on their law, for example roads constructed on dreaming sites.

EDO NT has participated in a number of public meetings held to discuss hydraulic fracturing, and we observe that in general, Territorians are concerned at the lack of rights afforded to them by the current Northern Territory laws. The particular concerns include:

- rights of land owners to control access to land or use of resources and infrastructure such as roads and water

- rights to access information about extent and impact of hydraulic fracturing

- rights to be consulted or make objection to specific exploration and production proposals

- rights to be informed and consulted about environmental impacts of specific hydraulic fracturing exercises

- rights to compensation

- inadequate regulatory oversight and response

- support and incentives given to explorers and producers as balanced against community and social support
- the economic costs of dealing with legacy wells and pollution
- competing land use interests and decline in property values
- lack of scientific evidence on which to base decisions
- rapid rate of escalation of the industry and the process of hydraulic fracturing
- deterioration of remote area infrastructure such as roads
- concerns about social impacts

EDO NT believes that the hydraulic fracturing industry has not achieved a social licence to operate in the Northern Territory.

If a social license to operate comprises three levels of legitimacy – economic legitimacy, socio-political legitimacy and interactional trust[19], our clients and stakeholders have demonstrated to us that the industry has not achieved the basic level of economic legitimacy in the Northern Territory. Our clients and stakeholders do not believe that the industry offers a benefit to them.

Dialogue that involves communities, companies and governments is a potential approach to addressing community expectations in ways that are seen as legitimate, credible and trustworthy.

In order for the industry to earn and retain a social licence to operate community concerns must be addressed through adequate research on all potential impacts of natural gas production from deep shale, establishment of baseline environmental conditions, and ongoing monitoring. Effective, transparent and adaptive regulatory frameworks will be critical to ensure that potential environmental and social risks are mitigated. Best practice principles must be adhered to and impacts remediated where they occur. Building and maintaining robust, accurate, transparent and properly connected information sets on the technical, economic, environmental and social aspects related to the deployment of these technologies will be a critical enabler for these outcomes[20].

[19] The Social Licence to Operate and Coal Seam Gas Development, Gas Industry Social and Environmental Research Alliance, Literature Review Report 31 March 2013.

http://www.gisera.org.au/publications/tech_reports_papers/socioeco-proj-5-lit-review.pdf

[20] Extract from Engineering Energy: Unconventional Gas Production – Report by the Australian Council of Learned Academics fro PMSEIC, June 2013

http://www.chiefscientist.gov.au/wp-content/uploads/shalegas-recommendationsFINAL.pdf

Part 3 - Comments on specific Terms of References

1. Historical and proposed use of hydraulic fracturing (exploration, appraisal and production) of hydrocarbon deposits in the Northern Territory (number of wells; locations; timeline).

The EDONT notes, with criticism, the lack of publicly available information regarding the historical use of fracking in the Northern Territory. Prior to the Department of Mines and Energy submission to this inquiry, made on 30 May 2014, very little was known about the extent of the use of 'fracking' within the Territory.

The information provided in that submission is vague at best, and the department is not even able to specific about the number of wells that were fractured, we note that in each area the number of wells fractured is qualified by the word "about". Additionally, we note the wording used in the DME submission in relation to adverse issues. In each case the DME submission states, "no adverse issues were reported, or in the case of the Palm Valley area "no major issues were reported". This suggests that, firstly, issues were reported in Palm Valley and, secondly, that there has been a complete reliance on companies self-reporting. This is a particular concern and raises concerns about DMEs ability to continually monitor and enforce regulations.

We also note the distinction between fracturing a vertical well and a horizontal well. It would appear that horizontal fracturing has only occurred at the Owen 3H, Baldwin 2JST 1 and MacIntyre 2H wells, operated by PetroFrontier, in the Southern Georgina Basin in 2012. This is insufficient time for environmental impacts to be adequately assessed. It is misleading for the government to assert that fracturing has been occurring throughout the Territory for years without incident. It is misleading because it fails to provide the community with the full picture of what has been happening. It is crucial also to understand what 'non-major' issues were reported in the Palm Valley area.

2. Environmental outcomes of each hydraulic fracturing activity for hydrocarbon resources in the Northern Territory (number of wells; frequency of types of known environmental impacts).

EDO NT is concerned about:

- The cumulative impacts of hydraulic fracturing activity
- The length of time before environmental damage is manifested
- The lack of scientific understanding of impacts.

3. Frequency of types and causes of environmental impacts from hydraulic fracturing for hydrocarbon deposits in the Northern Territory and for similar deposits in other parts of the world.

Potential impacts are many and risk is high

1. Habitat fragmentation
2. Groundwater extraction
3. Pollution
4. Altered fire regimes – and resultant impacts on habitat types threatened, keystone and other vulnerable species.
5. Human health impacts
6. Soil impacts
7. Spread of invasive species
8. Impacts on surface and ground water
9. Induced seismicity
10. Greenhouse gas emissions

4. The potential for multiple well pads to reduce or enhance the risks of environmental impacts.

- The more wells the greater likelihood of environmental impacts and risks.
- The EIS process should consider cumulative impacts.

5. The relationship between environmental outcomes of hydraulic fracturing of shale petroleum deposits with geology, hydrogeology and hydrology

Seismicity

In order to develop an appropriate framework to mitigate risks associated with induced seismicity, NT regulators need to:

- Establish necessary scientific background on seismicity and structural geology,
- Establish a response strategy to an instance of induced seismicity
- Adopt worlds best trigger levels to manage seismicity caused by fracking and fluid injection such as 0.5 M used by the United Kingdom (Green at al. 2012). [21]

Hydrogeology

A large amount of uncertainty remains about the hydrogeology of large parts of the Northern Territory. Most of the understanding is based on a reliance on computer modelling. It is clear that in scenarios such as this, where scientific understanding is incomplete, a cautious approach in line with the internationally established precautionary principle is appropriate. Legislation regulating 'fracking' should reflect this along with the other principles of ESD.

[21] Frogtech: "Potential Geological Risks Associated with Shale Gas Production in Australia 2013"

Before 'fracking' operations are approved significant baseline data should be obtained. This should be at the cost of the companies who want to 'frack' an area. We note section 1-80 of the Illinois *Hydraulic Fracturing Regulatory Act* (HFRA) as a best practice example of regulations requiring the obtaining of baseline data. The *HFRA* requires an operator to assess baseline and post-fracking surface and ground water conditions, via the employment of independent third party engineers. EDONT urges the commissioner to take particular note of the way 'fracking' is regulated in Illinois.[22]

6. The potential for regional and area variations of the risk of environmental impacts from hydraulic fracturing in the Northern Territory.

There is a high potential for variation in environmental risks due to variations in climate and habitat types and availability of ground water.

7. Effective methods for mitigating potential environment impacts before, during and after hydraulic fracturing with reference to:

7 a) the selection of sites for wells

- Well should avoid areas that are sensitive for reason of cultural or spiritual significance, historical or social importance and environmental significance.

- Wells should avoid sources of potable water.

- Land use conflicts should be avoided.

7 b) well design, construction, standards, control and operational safety and well integrity ratings

The New South Wales Well Integrity Code seeks to ensure that well operations are carried out safely, without risk to health and without detriment to the environment. The Code covers the design, construction, maintenance and abandonment of wells. The Code does not apply to seismic shot holes, monitoring bores; water-monitoring bores and exploration holes deemed to be 'frontier exploration' holes.

The New South Wales Fracture Stimulation Activities Code sets out requirements to ensure that CSG facture stimulation activities (fracking) are conducted in a safe manner and that communities, the environment and water resources are protected. Prior to the commencement of fracking, a Fracture Stimulation Management Plan (FSMP) must be prepared by the titleholder and approved by the NSW Government. The FSMP should identify and demonstrate how all relevant issues associated with the fracking will be managed to ensure that residual risks to the environment, community and workforce are reduced to acceptable levels.

[22] http://www.ilga.gov/legislation/publicacts/98/098-0022.htm section 1-80

The development of similar relevant Codes of Practice which operate as standards and required by law, will assist in regulating and mitigating the potential environmental impacts of hydraulic fracturing in the Northern territory.

Some important differences include the fact that unlike CSG in Australia, where about 10-40% of wells are hydraulically fractured or “fracked”, virtually 100% of shale gas wells will be need to be fracked.

Potential water contamination may come from well failure, stimulating fractures/faults and poor handling of produced water.

7 c) water use

Much of the potential shale gas in Northern Territory is located in semi-arid to arid regions and is therefore mostly reliant on slowly recharged groundwater. A fully developed shale gas industry in an arid area has the potential to become a major user of groundwater relative to sustainable extraction levels. As a result, it will be necessary to examine fracking water use to determine the effects of groundwater withdrawal on the environment and other users.

To protect ground water and surface water resources, the legislation requires:

- Development of necessary scientific background
- Development of setback rules (minimum distance to other users) to protect other groundwater users (including groundwater dependent ecosystems) and surface water resources.
- Development of minimum values for vertical and horizontal separation of shale gas resources from potable aquifers based on best practice.

7 e) disposal and treatment of wastewater and drilling muds

Produced water is a highly saline mix of recovered fracking fluid and connate water from the shale. Typically from 30-70% of injected water is recovered. When this water reaches the surface it must be stored, treated and disposed of properly to avoid damage to the environment, people and water supplies.

Many of the issues caused by Coal Seam Gas operations on the eastern seaboard and internationally are not caused by the process of fracturing itself but instead through inappropriate methods of disposal of ‘fracking wastewater’. The disposal of wastewater is a greater problem with shale gas extraction than CSG. Again, EDONT notes the *HFRA* as best practice. The HFRA prohibits the storage of wastewater in open pits/dams. [23]

The EDONT would encourage similar legislative prohibitions to be incorporated into the Territory regulatory regime for ‘fracking’. Storage of wastewater in open pits may be particularly inappropriate in tropical parts of the Northern Territory that are subject to extreme rainfall events.

[23] ibid – section 1-75

Many statements have been made about the re-use and recycling of 'fracking wastewater'. EDONT is concerned that none of these statements have been backed up with specific examples detailing where water will be treated, to what standard, and at whose cost. If water is to be treated, the EDONT is concerned that the Northern Territory Government factor into any proposals assessment the cost to tax payers associated with road damage caused by the transportation of large volumes of water for treatment.

Other mitigating actions could include:

- Developing setback rules (minimum distance to other users) to protect other groundwater users (including groundwater dependent ecosystems) and surface water resources.
- Developing minimum values for vertical and horizontal separation of shale gas resources from potable aquifers based on best practice.
- Adding nontoxic environmental tracers to fracking fluid help to make cases of potential contamination more evident.

7 k) rehabilitation and closure of wells (exploratory and production) including issues associated with corrosion and long term post closure

Well operators should be required to submit an abandonment plan to the regulator, with open- ended liability for failures into the future.

7 l) Site rehabilitation for areas where hydraulic fracturing activities have occurred

The NT is already attempting to manage a large number of legacy mines. The security bonds collected for petroleum activities must be sufficient to rehabilitate sites in the event of operator failure to do so, without putting economic burden on tax payers.