Submission to the Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia

Introduction:

I'm a graduate of Sustainable Development and International Aid at Murdoch University. I started looking into the issue of fracking (by fracking I mean the whole process from cradle to grave, not just the 'fracturing' process alone) around 2010 when I heard about what it incorporates and the potential harmful impacts the practice can have. I was appalled to find out that this practice, with its huge water use, high risks of contamination and impacts on health, was not only happening in Australia (coal seam gas on the east coast), but also in its infancy in my home state, WA. Having spent most of my life in Perth, I've grown up with water shortages, our community always being reminded to be frugal with this precious resource. To enable an industry that not only uses phenomenal amounts of water and risks contaminating water sources, but also gets this most vital resource for free, I was compelled to find out more and help get the word out to the broader public, who at the time, generally had little knowledge of fracking compared to now, and to highlight that this industry was set to be rolled out in our state, without the majority of WA citizens knowing what this industry actually encompasses.

Over the years I have co-founded and lead a community group against fracking, to help inform the public of what this industry truly entails, since both industry, lobbyists and regulatory government department alike (the then DMP) were heavy on the spin and manipulative statements, and light on transparency and fact. I've also worked for 3 ENGOs on this campaign (the Conservation Council of WA and The Wilderness Society, whose submission I have also contributed to) and also Pew Charitable Trust on their Kimberley Like Nowhere Else campaign. During this time, I've travelled across Western Australia, meeting with MPs, doctors, farmers, oil & gas workers (often concerned with health, many say the impacts of this industry are far worse than we realise), also speaking with many individuals and communities who are highly concerned about the impacts of fracking and all associated practices. And rightfully so.

Through my years of reading, consultation and research, I've come to realise there are simply too many risks, and to our most important resources – air, water, environment, climate and our health. Many of my concerns have been addressed in other submissions from organisations such as Doctors for the Environment, Sustainable Energy Now, Environmental Defenders Office, Lock the Gate, and The Wilderness Society, whose opinions and values I strongly support and so, will not repeat them all here.

This industry and its potential expansion in WA are not in the public interest, merely the interest of the industry and its stakeholders. We do need this gas here in WA as we have a sufficient, if not an oversupply of LNG as is. It is clear that majority of the gas is intended for export, so gas prices here will stay the same, if not increase. We will just be left with the mess once the wells and infrastructure become stranded assets.

Regulations cannot address majority of the key issues relating to this industry's operations. For example, regulations cannot address the huge amount of water required in fracking, nor can regulations stop human error or greenhouse gas emissions contributing to climate change. Furthermore, the industry is progressing in the US compared to where it was at around 10-15 years ago, so that wells are using more and more water with more frack stages, laterals are longer, more wells per pad and so more proppant and chemicals are required. The future evolution of the industry here in WA and the scale at which it would reach (to be economically viable) if the moratorium is lifted must also be taken into consideration in the panels' assessment.

As such, I truly hope the inquiry panel, despite the restrictive terms of reference which are clearly shaped for an intended outcome towards regulation, will do what is truly in the best interests of the people and environment of this state. The panel's recommendations will impact the future of this state, those involved remembered for either supporting a sustainable, frack-free future for our communities or condemning us to a water depleted, toxic legacy that the fracking industry has proven to entail.

My key concerns

Greenhouse gas emissions:

- The domestic carbon pollution (equivalent) from the Kimberley's Canning Basin (WA's largest unconventional gas reserve) through fracking would emit carbon pollution two times more than Australia's energy sector budget, in order to comply with our commitments to the Paris Agreement. This is unacceptable (Climate Analytics, 2018). The Australia Institute states that a 66-75% renewable energy target by 2030 is needed to meet its commitments. Fracking would only stall the urgent progression towards this renewable energy future that we need. Despite industry claims, fracking is not a bridging fuel and the statistics show, we cannot afford the methane emissions and total greenhouse gas footprint this industry carries.

  https://www.theguardian.com/australia-news/2017/sep/25/australia-failing-to-meet-paris-targets-and-more-renewables-needed-report-says

  Climate Analytics. 2018. Western Australia's gas gamble - Implications of natural gas extraction in WA. Retrieved March 19 2018 : http://climateanalytics.org/publications/2018/western-australias-gas-gamble.html

- Emissions from unconventional gas practices have been severely underestimated in Australia (The Australia Institute, 2017). Current methodology for measuring greenhouse gas emissions from unconventional gas extraction is based on assumed and outdated methane emissions factors, rather than direct measurement of wells, pipelines and other gasfield infrastructure. The estimate used by the Australian Government is 0.058 tonnes of methane leaked per kilotonne of methane produced, or 0.0058%. This estimate is based on an historic USA emissions factor designed for measuring conventional gas emissions and is no longer used in the USA. Actual measurements by 16 peer reviewed research projects, using improved technology to take direct measurements from gas fields in the US, have ranged from 2-17% of production (Lafleur, 2016). Further, if the US example is to be referred to, the shale gas boom claimed to reduce CO2 emissions, however, total greenhouse gas emission from fossil fuel use in the US rose between 2009 and 2013 (Howarth, 2015).

Howarth, R.W. (2015). Methane emissions and climatic warming risk from hydraulic fracturing and shale gas development: implications for policy. In 'Energy and Emission Control Technologies' 2015:3 45-54.

Lafleur, D., Forcey, T., Saddler, H., and Sandiford, M. (2016). A review of current and future methane emissions from Australian unconventional oil and gas production. Melbourne Energy Institute - University of Melbourne.

The Australia Institute. (2017). Scientific inquiry into hydraulic fracturing in the Northern Territory – submission.

- Despite this, if fracking goes ahead, we need independent monitoring and the review of all impacts of greenhouse emissions, as according to the WA Labor platform:

  "**WA Labor** supports a scientific approach to the regulation of fracking, and will conduct a public inquiry to examine environment, health, agriculture, heritage and community impacts (including **full analysis of lifecycle greenhouse gas emissions**) prior to any fracking activity (including future exploration)." Hansard 2015

  To date, no assessment of lifecycle emissions has taken place in Australia except for Queensland, however, they only looked at 5 wells chosen by companies.

  The emissions ie. total carbon footprint alone deems this industry unacceptable for our state and justifies a permanent ban including all exploration.

Water:

- As explained previously the water intensity, especially considering cumulative impacts of many wells across gasfields is justification in itself to ban all fracking practices in WA.
- "The Department of Water in Western Australia warns that, as the climate changes, the need to use water resources carefully will continue to be vital for population growth in Perth and in the south of the state." Fracking does not fit with our future water needs and long term wellbeing as a state.
- I strongly urge the panel to find out if projected expansion of fracking, if the moratorium is lifted, has been included in Department of Water projections and future rationing of water supplies for our growing population and for addressing other industry demands (ie. longer term, more important and essentially more sustainable industries such as agriculture).

Well integrity:

- "According to Schlumberger, one of the world's largest companies specializing in fracking, **about five percent of wells leak immediately**, **50 percent leak after 15 years**, and **60 percent leak after 30 years**. Data from Pennsylvania's Department of Environmental Protection (DEP) for 2000-2012 show over **nine percent** of shale gas wells drilled in the state's northeastern counties leaking **within the first five years**. Leaks pose serious risks including potential loss of life or property from explosions and the migration of gas or other chemicals into drinking water supplies"
  Retrieved March 2018: https://www.engagemmd.org/single-post/2015/10/23/COMPENDIUM-30-Part-3---Engineering)
- "There is **no evidence to suggest that the problem of cement and well casing impairment is abating**. Indeed, a 2014 analysis of more than 75,000 compliance reports for more than

41,000 wells in Pennsylvania found that **newer wells have higher leakage rates and that unconventional shale gas wells leak more than conventional wells drilled within the same time period**. Industry has no solution for rectifying the chronic problem of well casing/cement leakage."

Concerned Health Professionals of New York. (2018). Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction) Fifth Edition. Page 87. Retrieved March 2018: http://concernedhealthny.org/wp-content/uploads/2018/03/Fracking_Science_Compendium_5FINAL.pdf

- Of the 11 wells (DMP statistic from 2017) fracked in WA using this modern method, we have already seen a well integrity issue at the AWE Corybas 1 well near Dongara, on the Grange farm in 2012 where a 3rd party community member ie. not the company or regulatory body responsible for the oversight of the well – discovered methane bubbling at the well head after a storm.

Contamination, Chemicals and other Pollutants:

- A retention pond in the Kimberley overflowed due to a storm and a well head leaking gas for an undetermined period of time, also noticed by a 3rd party. Given the increasingly unpredictable rains of the Kimberley – fracking really makes no sense in this region. The Kimberley is one of the last true wildernesses, a cultural and tourist icon and region of unique environmental diversity and beauty. A short term destructive industry like fracking would ruin this region for all future generations. This is truly no place for gasfields and an industrialised landscape.
- Chemical use – while industry stunts claiming to drink frack fluids have attempted to lighten the topic, had they have drank frack fluids after mixing the chemical cocktails or flow back fluids, they would most likely not be alive today to tell the tale! Many chemicals in frack fluids are known carcinogens, mutagens, allergens, with flow back fluids containing mobilised naturally occurring heavy metals, radioactive matter and volatile organise compounds harmful to humans, animals and environmental health.
  Some constituents of flowback fluids are hazardous to health even at extreme dilutions.
- Reactions between frack fluids and naturally occurring substances have occurred and are terribly understudied. One such compound that is neither found in frack fluids nor naturally - is 4-nitroquinoline-1-oxide (4-NQO), which was found in flowback fluids from Marcellus gas wells in Pennsylvania and West Virginia (Bishop, 2010). This substance is one of the most potent carcinogens (dangerous at parts-per-trillion) and clearly would pose a challenge to dispose of safely.

  Bishop, R.E. (2010). Chemical and biological hazards posed by drilling exploratory shale gas wells in Pennsylvania's Delaware River Basin. Report for the Delaware River Basin Commission Exploratory Well Hearing. Retrieved from: http://www.damascuscitizensforsustainability.org/wp-content/uploads/2017/07/Bishop-Report_R1.pdf

Additional points of concern:

- Lack of study into health effects of fracking, particularly long term.
- Lack of study into impacts on delicate ecosystems eg. areas of conservation value, subterranean ecosystems eg.

http://www.australiangeographic.com.au/news/2013/08/bizarre-new-species-stops-pilliga-mining

- Lack of knowledge of interconnectivity of alluvial aquifer - Fitzroy River, Kimberley
- Rights for landholders and Traditional Owners to say 'no' to fracking.

Conclusion:

Oil and gas, like mining on the whole, is a boom and bust industry. Fracking might lead to short term gain for the few, and win political brownie points for some, but would, in a fairly short lifespan of possibly 10-15 years, develop at our community's expense (in every sense of the word). I do not want my state, my home, from the farmlands in the Midwest to the global icon of the Kimberley, to be turned into an industrialised landscape. The absurdity of this prospect still shocks me, despite having known about this industry for a while now. Regulations will not safeguard our communities, our water or our climate. Therefore, I strongly urge the panel to recommend a statewide ban on fracking for WA.

Personal Details:
Claire McKinnon
[redacted]