PERSONAL SUBMISSION TO THE WA INDEPENDENT SCIENTIFIC PANEL INQUIRY INTO HYDRAULIC FRACTURE STIMULATION IN WESTERN AUSTRALIA, 2017-2018

My name is Catrina Scatena and I live with my husband and two young children in Bonniefield WA, some 5km North of Dongara. I purchased a block of land jointly with my parents, John and Pat Lalor, at 6 Foss Road, Irwin WA, in the year 2000. I lived there on and off, whilst working FIFO as a Metallurgist, from 2003 to 2008 during which time we established a very successful family vineyard and winery. One of the main reasons we chose to purchase this land was because of its fertile soil and beautifully clean, potable ground water.

In 2008 I left the mining industry to have our first child and purchased Dongara IGA with my husband and a business partner. We now have two children and have lived in Dongara ever since. We cherish the lifestyle that comes with living in a small coastal town and the clean environment that we live and are raising our children within. I became aware of the potential future use of hydraulic fracture stimulation in the Irwin area in approximately 2011 through other concerned locals.

I have many concerns about hydraulic fracture stimulation (fracking) and I want to see a permanent ban in not only the Midwest but the whole of Western Australia for the following reasons:

- Well failure and an increased release of greenhouse gases. Methane is about 34 times more potent as a climate change-fuelling greenhouse gas than carbon dioxide over a span of 100 years. Over 20 years, it's 86 times more potent. Of all the greenhouse gases emitted by humans worldwide, methane contributes more than 40 percent of all radiative forcing, a measure of trapped heat in the atmosphere and a measuring stick of a changing climate [1]. There have been fracking well failures in the Midwest already, for example AWE's Corybas wellhead on The Grange farm south of Dongara [2].
- Well failure and the contamination of ground water. Elevated levels of methane have been detected in water bores adjacent to the Drover 1 fracking well in the Shire of Coorow [3]. Fracking wells are normally abandoned once the flowrates become unprofitable, even though gas is usually still available, just not flowing fast enough to warrant continuing the extraction. After a shale fracking well is abandoned and plugged, the well remains pressurised. The continuing pressure means that any conduits that do appear later, because of failures or geological movement, will have gas and fluids travel along them. From a ground water contamination perspective, the potential for disaster is huge. If only 1 fracking well or future conduit connects to a water aquifer, that aquifer can be contaminated with methane, drilling fluids and their by-products, and any other toxins released from the shale by fracking. There are many fracking wells planned for the Irwin area, that means every time a borehole goes through an aquifer there is a chance of well leakage. Since all wells are deep they are likely to go through multiple aquifers [4].
- Ground water is precious and should be protected at all costs by our Government for the future of all Australians. 'On the other side of the world, the industry (fracking) has largely stalled in Australia. Concerns over scarce water supplies have seen five of the country's eight states and territories essentially temporarily banning fracking. The federal government wants to see the bans dropped, but polls have found 49% of Australians support the fracking ban in their state, compared to 24% against it' [5]. 'In 24 cases the Pennsylvania DEP concluded that there had been a "failure to prevent migrations to fresh groundwater" [6]. Since 2005, the state has confirmed more than 100 cases of water-well contamination from oil and gas activities [7]' [8].
- "Wells are only monitored for two years after they are plugged and abandoned", said DMP executive director Bill Tinapple [2]. Significant data exists on early life (generally fixed as part of the construction) well failure and steady state (after the wells have been plugged) well failure. Less data exists for mature (old wells) well failure as we don't really know when they will get there. How long will the materials used in constructing the wells last? What slow-acting geographical processes are happening? Could be 50 years, could be 100 years, but failure will eventually happen. It is also likely that the Oil & Gas company responsible for the well will no longer be there to clean it up [4]. Property owners and communities will exist long beyond the life of fracking wells, they will be left with the burden of mature well failure.

- After fracking at each well, the large volumes of hazardous flow back fluid must be stored and disposed of. Surface water pollution can occur:
    - When there are accidental spills of fluids or solids at the surface
    - When well blow outs occur
    - Through discharge of insufficiently treated waste water onto land surfaces or into waterways [9, 10, 11, 12]
- Flowback fluids contain hazardous fracking chemicals as well as naturally occurring toxic substances released from target geological zones such as:
    - Methane
    - BTEX (benzene, toluene, ethylbenzene, xylene)
    - Polycyclic aromatic hydrocarbons (PAHs)
    - Naturally occurring radioactive materials (NORMS)
    - Heavy metals and other volatile organic compounds (VOCs) [13, 14, 15, 16]
- The Irwin area is beautiful productive land which has been identified as a potential food bowl due to it's abundant fresh ground water. Unconventional gas mining, due to it's required well density, will have a huge impact on the Irwin district, transforming it into an industrial landscape.
- Unconventional gas operations can have serious consequences for human and animal health. Baseline health data for Irwin residents living within the existing gas field have not been carried out. Physical and mental health effects of this industry and already starting to show on some Irwin residents, but are these effects being taken seriously if there is no data to compare? Unconventional gas mining poses risks to health, both directly and indirectly, and at the local, regional and global level. Thus, decisions on unconventional gas mining made by all Australian states and territories, and by other nations, affect us all [17].
- In June 2015, 97.7% of Irwin residents declared itself frack free, becoming the fifth community in the Midwest to do so. The majority of Irwin residents do not want an unconventional gas field in the Shire, the state, Australia or even the world, for the following potential community impacts:
    - Contamination of ground and surface water
    - Loss of economic incomes reliant on clean irrigation water
    - Negative effects on land value
    - Negative effects on physical and mental health of the community
    - Cumulative effects on the environment
    - Living with the burden of the industry once the oil & gas companies have left
    - Conflict within the community [18].
- Renewable energies are partly being overlooked for access to otherwise uneconomical and unattainable fossil fuels thanks to fracking. I personally feel let down by all levels of Australian Government for the continued support of fossil fuel energies. I am concerned for my children's future and the lack of importance being placed on renewable energies by our Federal Government. 'In the wake of federal funding for Adani, The Australia Institute commissioned a poll asking people if they preferred government investment in renewables or coal infrastructure: 75% supported renewables. With renewables being cheaper than fossil fuels, better job creators, more reliable, becoming internationally adopted and more popular — even before we consider the urgent need to tackle climate change — surely Australia's banks should be investing in renewables. Instead, they are investing billions in constructing major new fossil fuel projects, such as an oil base in Norway, the Adani coalmine, a gasfield in PNG and the Browse basin gas field in WA, to name just a few examples. Once these projects are built it will be even harder to roll them back, the energy produced will be more expensive than renewables and billions of dollars that could have gone to renewables will have been wasted. Why do they do it? The simple reason is to make a profit. Under the free market, every market mechanism, such as carbon offsets, leads to new ways of making a profit. Australia exports more coal than it uses and exported coal will not feature on any of the market mechanisms to reduce emissions in Australia. The fossil fuel industry is also a mechanism for extremely wealthy corporations, with the help of their armies of lobbyists and media ownership, to funnel money from the public coffers to themselves via government subsidies. Even if we increase our renewable energy generation, as long as there is money to be made from fossil fuels they will be pursued' [19].

- Under current petroleum legislation, land owners have no ultimate right of refusal for access to land. Just like provisions in the Mining Act 1978, West Australian farmers should have right of VETO over oil and gas exploration, production and rehabilitation on private land.
- Fracking is an extremely water-intensive practise, a concern when water is not an infinite supply and supports our ongoing community. Estimated water usage for a typical fracking well during the exploration, evaluation and production stages are:
    - Exploration 7 million litres
    - Evaluation 7 – 17 million litres
    - Production 21 million litres [20].

  Wells are often fracked on multiple occasions, sometimes up to ten times, multiplying overall water use. Some of this fluid returns to the surface as flowback, but most stays underground and is never recovered – estimates suggest 70% or more remains underground [21].

I believe that fracking should be banned in not only the Midwest but the whole of Western Australia. The cumulative risk of all environmental, health and social impacts is enormous, regardless of whether some of those impacts can be avoided, mitigated or managed through regulation. I don't believe that the risks associated with fracking can ever be controlled enough to guarantee protection of our water aquifers, because at the end of the day, the industry is run by people. "Bad stuff happens for all sorts of reasons, including mechanical failures. But generally, the root cause can be traced back to (at least partially) human behaviour – NORMAL human behaviour. Things like laziness, incompetence, corruption, GREED, pride, ego…" [4].

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