



23rd February 2018
Northern Territory Fracking Inquiry,

To whom it may concern,

I am an Earth and environmental scientist specialising in hydrology and arid-semi arid landscapes and I am currently undertaking hydrological research at Lake Woods. I have worked in every state and territory across the continent and elsewhere in the globe. In 2012 I coordinated the bioregional assessment into the risks associated with coal seam gas (CSG) mining and long-wall mining in the Sydney basin. This assessment and my knowledge about arid and semi-arid lakes and rivers has me extremely concerned about the proposal to lift the moratorium into shale gas development in the Northern Territory (NT). It is for these reasons that I am suggesting that it is absolutely critical that no exploration or production licenses are granted until a thorough strategic regional environmental and baseline assessment (SREBA) is undertaken. After a SREBA is undertaken there may well be good reasons that the risk is too high to proceed in some or all areas. However, there are many other arguments (e.g. cultural, ecological or emissions-related) as to why shale gas may not be the best resource management decision a state government could make for the NT. I imagine others will present this case. There is no doubt that if terrestrial shale-gas proceeds in the NT then it will have long-lasting impacts that will be detrimental to the landscapes, social and economic fabric of the state. I also have no doubt that it will signal an irreversible change to the landscapes and their hydrology. I will outline some of the specific concerns I have below.

I have read the summary of the draft final report (summary and chapters) into hydraulic fracturing in the Northern Territory and it is inadequate in many regards. This is not a reflection of the authors but is due to the extremely limited data that exists. Many of the assumptions presented in the summary and the main chapters (especially water) rely heavily on the literature and experiences in the United States of America (USA). In our assessment into potential risks in the Sydney basin we found that fundamental information that ordinarily would be used to accurately predict risk were simply not available. After reading the summary and Chapter 7 I believe **the panel have severely underestimated the risks on water** associated with shale gas development given the lack of relevant and basin-specific information. These major knowledge gaps can be summarised as:

1. Unquantified recharge rates in the southern Beetaloo basin - assumed or limited data will have very large uncertainties and therefore risk needs to be propagated into the assessment.
2. Aquifer connectivity – this is major determining factor for potential contamination and nowhere in the submissions are these adequately addressed.
3. Surface-sub-surface interactions – this is key aspect when managing produced water and the risks associated with spills.
4. Distribution of faults and joint patterns in the underlying lithology - these play a major role in determining flow paths and potential risks.



In addition I believe the assessment has fundamentally overlooked long-term well integrity. The long-term viability of preventing aquifer disruption or cross-contamination is completely dependent on the maintenance of the wells, post production. In my experience, loose state regulations often only require the proponent to be responsible for a short period of time, post production leaving a financial and environmental disaster for subsequent governments and society.

I am more than happy to provide further detail but in my professional opinion our capacity to assess the real risks of such a shale-gas mining development is currently extremely poor.

Kind regards,

A handwritten signature in black ink, appearing to be 'Tim Cohen', written over a light blue grid background.

Associate Professor Tim Cohen
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