Submission to the the Inquiry into the Landholders' Rights to Refuse (Gas and Coal) Bill 2015

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Abstract

This submission will outline well founded reasons why land holders must have the right to stop access to their land by unconventional gas exploration and development companies accessing their land without their written permission.

These activities potentially

1. will degrade the arable land
2. will diminish the water table
3. will put at risk water supplies through the use of toxic chemicals and exposed NORMS and TENORMS
4. will interfere adversely with natural hydrology systems
5. will pollute the land through chemical spillages, and waste product water hazards
6. will pollute the air with methane leaks, venting and flaring and evaporation ponds
7. will industrialise roads, work and living spaces with 24 hour noise, traffic and lights
8. will affect the health of residents, workers, and especially children, through the aforementioned
9. will counter the democratic rights of landholders to pursue their legitimate occupations with safe living and healthy land, water and air.
10. will reduce property prices substantially
11. rehabilitation will not be possible to pre existing land standards

1. Land degradation

Unconventional gas exploration requires large expanses of connecting pipelines and roads. This excises large acreage from the landowners' rights to their property, the above ground areas being their legitimate rights. Whilst the states own the minerals/petroleum etc under the ground, these cannot, nor should not be accessed via destruction of the topography of private landholdings.

2. Water extraction

From fracking to production, a substantial amount of water is required in unconventional gas extraction in particular. Every fracked well may require up to 20 million litres of fresh water, 4,000 tons of proppants, and up to 200,000 litres of chemicals (IEA 2012a:27:IEA 2012b:33). This is of great concern in the driest populated continent, at a time when precipitation is decreasing, and temperatures are rising. The unconventional gas and coal industries compete with the water needs of agriculture, of urban and regional populations, and of the sustainability of our natural environment.

In Barnhart Texas, The Guardian (13.8.13) headline reads “A Texan Tragedy: Ample Oil, No Water. Fracking sucks away precious water from beneath the ground, leaving cattle dead, farms bone-dry, and people thirsty.” The local wells and main water supply to the town had dried up. This is just one example of conflict between industry and basic human needs.

3. Water contamination

Water contamination can occur via a number of routes, including pre-existing fractures and faults, as well as those caused through the hydraulic fracturing process (Meyers 2012) (Warner 2012) (Gross 2013) (Adams 2011) (Osborn 2011).The fracturing of the target formation releases not only the sought after methane gas, but many other organic compounds that have been safely locked in the rocks for aeons. Whilst in WA, the highly toxic and carcinogenic BTEX chemicals have reportedly been banned from the chemical injection fluids, they nevertheless are naturally occurring within target formations. Once fracked, the surface area of the rock is multiplied many times. This means that these compounds are mobilised and much more readily available to contaminate whatever they come in contact with. Between 15% and 80% of the injected water and fracking chemicals now mixed with the many other organic compounds are returned to the surface. The rest remains underground, potentially causing harm in the future. Industry and lobbyist claims that well casings and cap rock stop leakage and seepage of these fluids and gas, however global evidence proves otherwise.

There is growing evidence that despite the thick layers of rock above the target formation, toxic waste substances can make their way through not fully understood means, into overlying aquifers (Lustgarten 2012). Until all possibilities and risks are fully understood, this industry should not be given the go-ahead.

4. Natural Hydrology systems at risk

Our hydro-geological systems and their interconnections across diverse layers are neither fully mapped nor fully understood. Dewatering and heavy water abstraction changes water pressures underground and consequently their flows, affecting spring, streams, rivers and lakes.

5. Topographical damage to land

Overhead images of gas fields are well known. Connecting roads and pipelines crisscross the landscape and transform previously productive, fertile and picturesque land, including nature reserves and farmland, into industrial wastelands. It disrupts the natural ecology, removing trees and vegetation that support life, changing the landscape to polluting entities destructive of life. Even before industry has established itself, seismic surveys already decimate ecosystems through their grid-patterned land clearing. Recent land clearing in Beekeepers Nature Reserve in the Midwest of WA is one such example of clearing in a highly biodiverse and in theory, ‘protected’ area, risking the spread of dieback and cutting ecosystems in isolated patches, despite their need for connected strips for ecosystems to maintain their full function. Local land holders are impacted, and dieback is a common risk in such regions.

Broomfield (2012) estimates that approximately 50 shale gas wells may be needed to give a similar yield as one North Sea gas well. He also compares the surface well installation area during the fracturing and completion periods as approximately 3.6 hectares per pad compared with conventional drilling which needs approximately 1.9 hectares.

Ditches dug for expansive pipe construction can divide properties for long periods, making it extremely difficult for farmers to traverse their property. Livestock have also become stuck and injured falling into them.

6. Air pollution

Many particulates and chemicals are released into the atmosphere in fracking processes including sulphuric oxide, nitrogen, volatile organic compounds, benzene, toluene, diesel fuel, hydrogen sulphide, and radon gas. The drilling sludge, which is brought to the surface during the drilling process, contains fracking fluid, drilling mud, and radioactive material from the target formation, hydrocarbons, heavy metals, and volatile organic compounds. The sludge is often left to dry out (evaporate) in surface waste pits. Alternatively it may be removed to waste disposal sites (not always hazardous waste sites) or may be tilled into the soil in ‘land farms’. These practices raise the risk of contaminating soil, air, and surface water, as a result of the fine dust becoming air-born (Finkel & Law 2011).

Fugitive emissions are well documented at all stages of the fracking process (Howarth 2011) (Finkel 2013).

Well completion methane escapes during the initial drilling process; well head problems including corrosion are a source of methane leakage and flaring is frequently permitted despite the fact that many fracking chemicals are known to be hazardous, carcinogenic, and when heated may release toxic gases. These flaring practices can take place close to human habitation without regard to health consequences. Venting (non-captured methane) is forbidden in many jurisdictions and is estimated to occur more frequently than flaring (Howarth et al 2012); compressor stations are a big source of fugitive emissions and consequent air pollution and have exploded at times; gas pipes also are subject to aging, corrosion, leaks and explosions.

Christopher Busby, an expert on the health effects of ionizing radiation and is the Scientific Secretary of the European Committee on Radiation risk, has written extensively on this topic (Busby 2013). Among the most concerning of the released material are part of the uranium chain; Naturally Occurring Radio Active Material (NORM). Human activities such as gas exploration can expose people to this ionising radiation. Notably Radium 226 is one of those released. When this reaches air, it becomes radon gas. This has been detected in greater quantities around gas fields and is highly carcinogenic. NORM’s can also attach as scale to pipes and other mining equipment such as the trucks used for transporting waste. All of these materials then become hazardous radioactive waste which is very difficult to dispose of safely. The waste water can also be radioactive.

7. Industrialization of the land

With conventional gas extraction and unconventional gas fracking, noise is not an insignificant problem for local communities, many of whom are used to a slower paced and peaceful rural lifestyle. The noise is usually 24 hours per day, with a constant stream of trucks carrying chemicals, water, sand or silica, and toxic waste material. The diesel trucks are also a source of pollution, emitting diesel particulates. Then there is the onsite activity including infrastructure, transporting and building in the construction phase. Compressor stations are very noisy and operate 24 hours a day. Flaring is also noisy. Broomfield (2012) estimates that "for each well-pad (assuming 10 wells per pad) would require 800 to 2,500 days of noisy activity during pre-production, covering ground works and road construction as well as the hydraulic fracturing process".

8. Adverse health risks

There are many studies identifying the serious risks to public health through the life cycle of shale gas development. This can be through water, soil and air contamination (Gross 2013) (Lustgarten 2012) (Litovitz 2013). A health assessment of exposure to air emissions from shale gas development in Colorado found that residents that live within ½ mile from well pads are at greater risk of developing cancer and non-cancer health effects (McKenzie 2012).

Studies have shown that shale gas production is associated with raised atmospheric concentrations of tropospheric or ground level ozone, whereby nitrogen oxides, volatile organic compounds, and sunlight interact to produce hazardous respiratory irritants that increase s risks of morbidity and mortality (Schnell 2009) (Jerrett 2009) (Olaguer 2012) (Petron et al 2012).

9. Democratic rights of landholders to a safe living and work space

Ease of access to land and the resources which lie beneath them are key considerations by mining corporations. Land owners must have their rights clearly spelled out by these companies, councils and government, so that any 'bully' tactics and threats regarding confidentiality contracts can be put in to perspective. Phrases such as 'minimal impact', or 'minor adverse effects' should be clearly defined and spelled out. Moreover, once written approval to an activity is given, those persons can no longer be considered as 'affected persons.' This undermines the rights, safety and compensation for potential affected parties. Although landowners and occupiers do not own the oil and gas under their land, they do have the right to deny access by not signing access arrangements proposed by companies. This needs to be made clear to land owners.

10. Property price losses and questionable economic gain to communities

The economic wellbeing of communities where the oil and gas industries take hold has been documented in a five state study in Wester USA (Hepburn S. et al 2012).

They found that these activities had negative effects on change in per capita income, crime rate and education rates of host communities.

Certainly in the USA and Australia, few individuals wish to purchase properties near gasfields, leading to abandonment of homes and properties in some cases.

11 (a) Rehabilitation of land

This involves numerous steps that should begin with initial site selection. It is necessary to choose an optimal site says Bloomfield (2012) in order "to minimise adverse impacts on sensitive receptors." Assessment of baseline information regarding the site contours, vegetation, wildlife habitat and land function prior to being given a licence to drill are essential. It should be the regulators that assess these details rather than the drilling companies, so that successful environmental restoration can be determined after the event (Parkland Institute).Where mature native trees, necessary for bird habitation among other things, are removed, it is difficult to see how these can be replaced in the short term.

Additionally, regulators should be independent of industry, as opposed to the scenario such as that in WA where the regulators – the Department of Mines and Petroleum, are also promoters of the oil & gas industry and are clearly lacking true independence and oversight. This is a clear conflict of interest. Until such contentions are rectified, unconventional gas exploration and production should be halted.

Developer liability for water and soil contamination as well as inadequate land restoration should be determined before any leases or agreements are signed, as well as what steps will be taken to return the land to its original state (Skausen 2011).

Broomfield (2012) notes that "The evidence suggests that it may not be possible fully to restore sites in sensitive areas following well completions or abandonment, particularly in areas of high agricultural, natural or cultural value. Over a wider area with multiple installations, this could result in a significant loss or fragmentation of amenities or recreational facilities, valuable farmland or natural habitats."

(b) Soil compaction and topsoil removal

Soil compaction because of heavy machinery on the drill site and access roads needs to be addressed by tillage to at least 80 centimetre depth prior to top soil re-application, to optimise water filtration and revegetation. Even so there has been shown to be a decline in filtration on the land after a 3 year period (Chong 1997).

Careful topsoil removal and storage for later land restoration must be a requirement by the drilling companies. Skausen (2011) says that at least 2 feet and preferably 4 feet of topsoil should be salvaged for later restoration. It should be seeded with a vegetation cover if the stockpile is to remain for more than 6 months. It should be stored safely away from potentially contaminated operations and substances. Pipeline disturbances need the same attention.

(c) Removal of mining equipment and well abandonment
Removal of mining equipment is another area of concern. The waste ponds must be safely emptied without contamination of the site or surrounding land or water. It must be safely removed to hazardous waste facilities. The lining should also accompany this and not be buried on site, or on convenient nearby land.

Well abandonment is an under researched area of concern. Lustgarten (2011 and 2013) wrote of the EPA's initial serious concerns about contamination from abandoned wells, and again reported about the back flip of the EPA, which had initially promised a peer reviewed research as a follow up. Eventually the EPA handed over the responsibility of the research to the likely offender in the industry, Encana, thus… "effectively disengaging from any research that could be perceived as questioning the safety of fracking or oil drilling".

In WA, wells are supposed to be monitored after abandonment for 2 years. After this time, the company is no longer responsible for their integrity. This will leave the government departments responsible both for ongoing monitoring and potential contamination costs into the future. The alternative to ongoing monitoring of abandoned wells is to leave and ignore them. Thus when contamination occurs down the track, possibly away from the original well site, traceability of the source of contamination, and any remediation will be either seriously hampered, too expensive or impossible to remediate.

Whilst wells are supposed to be plugged and back-filled with concrete at the end of their active life, their integrity and permeability are unknown. Cement and steel (which well casings are made of) deteriorates over time, and the pipes which go deep into the ground and through aquifer systems, can and will corrode. This would both connect below levels of strata with the aquifers, and pose serious risks of contamination, both of the aquifers and the surface level soil and structures. Given that approximately 50% of waste water remaining under the ground, this should be a major concern.

Old wells have been known to cave in, again connecting differing geologic layers with the surface. In a New York study (Bishop 2012) found that in the last 25 years, the oil and gas industry consistently neglected to plug most (89%) of its depleted wells, and the rate has increased since the year 2000. This indicates a culture of neglect and avoidance of responsibility. Whether or not plugged with cement (which itself deteriorates and cracks with time) the leakage of methane and other toxins continue to occur without due oversight.

(d) Feasibility of land restoration
Broomfield (2012) questions that full restoration of sensitive ecological sites and archaeological sites is possible for hydraulic fracturing shale gas well projects.

When one looks at the extent of unconventional gas mining activities and the very large land footprint, covering areas of sensitive ecosystems; unique flora;

endangered species; habitat loss (especially mature trees); the arid and drought prone nature of much of the Western Australia, already threatened with significant global warming; the huge amount of water used for the process; the well documented and serious contamination risks to diminishing water supplies; the complex, expensive, and in some cases impossible task of achieving appropriate restoration; serious doubt about the viability of hydraulic fracturing for gas is posited.

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