Submission
No 374

INQUIRY INTO COAL SEAM GAS

Name: Mr Peter Meloy

Organisation: Central Coast Greens

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To the NSW Upper House Coal Seam Gas Inquiry,

Please find my submission, made on behalf of the Central Coast Greens below:

Term of Reference 1

- Coal Seam Gas (CSG) mining represents a serious threat to water resources due to:

1. .The fact that extracting CSG requires the removal of large volumes of generally saline "associated water" from the coal seam. The extraction of associated water can lower water levels in adjoining aquifers or in shallower, alluvial systems.
2 The fact that in many areas, we do not fully understand the degree of connectivity between different aquifers, nor the extent to which groundwater sources are connected to surface waters. In some places groundwater provides the base-flow to creeks and rivers; in others, creeks recharge groundwater aquifers.
3 The pollution of surface water systems from 'waste' water, leading to serious reductions in water quality.
4 The use of large volumes of water for drilling in water systems which are already over-allocated, such as the Murray-Darling Basin.

5 The location of CSG wells on sensitive floodplains and in water catchments. Examples: Discharge of treated 'waste' water by Eastern Star Gas into a creek in the Pilliga; location of CSG wells on the floodplain at Casino; exploratory drilling near Woronora Dam in water catchment areas of Sydney and the Illawarra; drilling near the Tomago sand beds water catchment area in the Hunter, native animal deaths at drill ponds in the Pilliga.
6 The potential for drawdown and contamination of groundwater aquifers, including potential for major cumulative impacts on the Great Artesian Basin.

- CSG mining produces vast quantities of waste water that represent a serious environmental risk:

1. The CSG water, also known as 'associated', 'produced' or 'formation' water, is regarded as a waste by-product. Large volumes must be removed from coal seams to allow gas to flow. This CSG water is generally high in sodium and contains many other contaminants. Each Megalitre of associated water brings up 5 - 8 tonnes of salt previously stored safely underground.
2. It is important to see what is happening in Queensland so we can compare effects in NSW. The Queensland government estimates that between 126,000 - 216,000 Ml of associated water will be extracted per year along with 630,000 - 1,728,000 tonnes of salt. To date detailed plans for use or disposal of these huge quantities of salt are lacking. Burial is proposed as the quantities are unsustainable and will become too vast to deal with in any other manner.
3. CSG water may also contain the naturally occurring elements in coal seams such as heavy metals, carcinogens such as benzene, toluene, ethyl benzene and xylene, and radioactive chemicals. Some of these highly toxic substances bio-accumulate, that is, they are concentrated as they move up the food chain.
4. In 2010 the Queensland Government decided to ban the evaporation of this water from large earth dams. The preference is to find economically beneficial uses for it. The water must now be stored until it can be treated, used or re-injected into an aquifer holding poor quality water. Re-injection is energy-intensive and expensive, and over the life of a gas field, risks the contamination of aquifers.
5. If untreated CSG water comes into contact with good quality, high clay-content soils, such as those on the NSW Liverpool Plains, the soil becomes impervious to water. Plant roots cannot penetrate. The soil will become barren and useless for agriculture.
6. If CSG water is accidentally released, for example through the failure of a dam wall or a spill, it could damage aquatic life in rivers and wetlands that depends on freshwater. Spillage of waste water lead to extensive tree death in the Pilliga
7. Treatment by reverse osmosis removes salt and can make CSG water fit for purposes including stock watering, irrigation and town water supply. However, this is expensive and energy intensive. The problem of how to dispose of the concentrated brine still remains.
8. Reverse osmosis does not remove some of the other contaminants. The Queensland DERM authorises CSG companies to dispose of certain amounts and concentrations of these

toxic substances by discharging them into creeks and rivers such as the Condamine. This has potentially very serious consequences for all those who rely on the Murray-Darling Basin for their water. In NSW a deliberate discharge of saline water led to a pollution event near Broke.

9. While individual releases may not cause serious damage, the total cumulative impact of discharges from all sites is unknown because Environmental Impact Studies only assess individual projects.

□ CSG mining represents a major threat to natural areas:

1. It leads to extensive clearing and fragmentation of native bushland and threatened species habitat and increases the risk of catastrophic bushfires.
2. It represents a major threat to wetland systems, even distant ones that are hydrologically connected.
3. It transforms major vegetation remnants, refuges and corridors into industrial zones
4. Even protected areas and public lands are not safe – CSG mining can occur in areas bordering National Parks, and is permitted in State Conservation Areas and State Forests.

□ Examples: Pilliga CSG mining will clear at least 2,400 hectares and fragment 85,000 hectares of public lands, including State Forests and State Conservation Areas; at Putty drilling is planned next to the World Heritage-listed Wollemi NP; at Poggy, drilling is occurring on an inholding in Goulburn River NP; in north-west NSW, Travelling Stock Routes are targeted for drilling and gas pipeline infrastructure; in the north-east, a pipeline is proposed through the World Heritage-listed Border Ranges NP.

□ CSG mining represents a serious risk to human health. One area to be impacted will be the ability to source safe, clean reliable drinking, agriculture and stock water

1. The Great Artesian Basin (GAB) is a resource of national importance. It lies under 22% of Australia and is the only reliable source of water in arid and many semi-arid areas. Springs fed by GAB waters support rare plants and animals found nowhere else. Current total extraction of water from the GAB is estimated to be 616,166 Megalitres per annum (ML/annum). The total amount of associated water extracted will depend on the size of the industry. The Qld Department of Environment and Resource Management estimate that between 126,000ML/annum and 216,000ML/annum will be extracted in Queensland.

As a result of this water extraction, pressure in adjoining aquifers could fall by up to 6,000 KPa (equivalent to 600 metres of water "head"), and cause some artesian bores to become sub-artesian, requiring expensive pumps to obtain water. Flows to some streams could be affected.

Water levels in the Walloon Coal Measures will not begin to recover until 70 years after CSG extraction has ceased. The Springbok and Precipice sandstones will not have recovered after 200 years. In the case of the Hutton Sandstones, recovery could take a thousand years. This could be our future in NSW if we do not follow the Precautionary Principle.

2. Due to potential contamination of water used for human consumption and agricultural production with chemicals present in the coal seam that will be released by:-

a) Leaking of toxic methane and other gases during gas production and migration of methane into water supplies.

b) Through poor management of chemicals and use of toxic chemicals without full disclosure, particularly during drilling.

□ Examples: The recent foamy discharge from a well at Camden; methane leaking from gas pipelines and a water drain in the Pilliga and from well-heads at Casino.

□ Other major environmental problems with CSG mining include:

1. The complete failure of remediation, even at the exploratory phase such as at Casino where drill ponds had not been remediated and in the Pilliga where there has been no rehabilitation of well-pads.
2. The fact that regulatory processes, including assessment, approval and compliance, are all woefully inadequate. This was evident in the approval of the Gloucester AGL project without details about what it entailed and the lack of resources or political will to enforce compliance in the Pilliga.
3. CSG is a fossil fuel which is a dirty energy source that adds to greenhouse pollution.
4. The CSG industry claims gas-fired power stations produce 70% less CO2 than existing coal-fired power stations. However, this figure only refers to the emissions released when the gas is burnt. It does not include the emissions involved in producing the gas such as the drilling, compressing, pumping, liquefying and transporting the gas; nor the loss of carbon-storing forests and woodlands cleared to make way for gas wells and pipes.

5. Liquefying natural gas consumes at least 20% of its energy value and cancels almost 30% of its "clean" character claim.
6. The substantial leaks of gas to atmosphere before combustion are not included in the 70% figure. Methane is the major component of natural gas. It is a much more potent greenhouse gas than CO2, 72 times more effective at trapping heat in the atmosphere over a period of 20 years, or 25 times more effective over 100 years. It is reported that one in four gas wells are leaking. The industry is self-regulating.
7. Monitoring of methane leakage in the oil and gas industry is limited, but conservative estimates suggest that during the life cycle of an average coal seam gas well, 3.6 - 7.9% of total production is emitted to the atmosphere as methane. This is at least 30% and perhaps more than twice as great as the life cycle methane emissions for conventional (natural) gas which range from 1.7 - 6%.
8. There is much about groundwater and the GAB that we do not know. It is not possible to completely mitigate against human errors and shortcuts taken due to economic pressures. It may not be possible to ever fix pollution of aquifers, or damage to recharge areas or springs.
9. The Pilliga forest in NSW is the largest temperate woodland in eastern Australia. It covers more than 500,000 hectares and is home to threatened species such as the Regent Honeyeater and the Pilliga Mouse. It also helps recharge the Great Artesian Basin. Eastern Star Gas plans to drill 1,100 gas-wells in the Pilliga. Each well requires clearing for a 1 hectare pad, an all-weather access road and a corridor for gas and water pipelines plus waste water storage ponds and other infrastructure such as condensers and compressors, the forest will be fragmented. A nationally significant bush icon will become an industrial wasteland. Gas pipelines will run from the Pilliga along environmentally sensitive Traveling Stock Routes to a liquid natural gas (LNG) export terminal in the Hunter estuary. The Hunter estuary's Ramsar-listed wetland is also at risk.
10. There is likely to be a significant impact on threatened species dependent on GAB springs.
11. Coal seam gas (CSG) is a fossil fuel and a significant source of greenhouse gas pollution. It generates more than 40 times the amount of greenhouse gas per unit of energy generated than solar or wind. Coal seam gas will make a major contribution to global warming, particularly when fugitive emissions and liquefaction prior to export are fully considered.

Term of Reference 2

- CSG mining causes major social impacts:

1. Landholders face the prospect of losing control of their land, their property values degraded and options for re-sale lost once exploration licences are issued.
2. The social fabric of communities is drastically weakened, with evidence that communities dominated by fly-in/fly-out workers show higher incidence of violence and crime, soaring rents and worsened mental health outcomes.
3. Tension between landholders as some sell out to the CSG industry and others don't.
4. Pits country against city by suggesting townships may be exempt.
5. Adds a serious psychiatric burden to farmers through worry about contamination of their air, water, food producing lands and lifestyle choice becoming an industrial setting.

- The rapid expansion the CSG industry looks set to have major economic impacts:

1. Food security is threatened by risks to groundwater and loss of arable land.
2. It is undermining economic diversity and leading to a skills shortage in other rural industries, and can lead to collapse of businesses unable to compete for staff.
3. It is likely to impact negatively on a whole range of other industries such as organic farming, tourism, vineyards and orchards.
4. It leads to important local infrastructure, such as roads, being run-down and damaged at a cost to the taxpayer.

Examples: Food security is threatened by CSG mining proposals on the Liverpool Plains, around Moree and Bellata, and the in Northern Rivers region; pipelines threaten to cause major erosion to self-mulching black soil plains around Mullaley; and CSG mining poses a threat to the vital hot springs tourist attractions from Pilliga to Moree.

- Other socio-economic issues with coal seam gas mining include:

1. Royalties paid to the State create an expectation that projects will be approved, whilst failing to deliver sufficient funds to offset the impact of CSG.

2. Local Government and local communities are currently largely excluded from the planning process and public participation and legal standing is inadequate.

Term of Reference 3

- Coal seam gas is not required to meet the future energy needs of NSW. Most gas in NSW is extracted for export, not to meet local energy needs.
- There is a lack of information about the whole lifecycle emissions for CSG production. US studies suggests unconventional gas has huge fugitive emission impacts.
- The only way to deliver energy security is to switch to renewable energy now, particularly solar thermal. There are vast solar thermal resources in the major areas where CSG is now proposed, such as Narrabri and Moree.
- The massive expansion in coal seam gas production is delaying the transition to renewable energy alternatives.

Term of Reference 4

- Coal seam gas mining is exempt from a number of other environmental statutes, including the Native Vegetation Act 2003 and the Water Management Act 2000.
- Legislation controlling activities on public lands are inadequate to prevent coal seam gas mining, which when approved effectively privatises public lands.
- Interaction with Federal legislation at the exploration phase is poorly understood and not enforced, for example, extensive exploration without getting Federal approval in the Pilliga.

Term of Reference 5

10. Experience from Queensland: significant problems with leaking wells; impacts on groundwater evidenced from drops in bore levels; growing social discord; an exploding well at Dalby; major impacts on natural values near Gladstone; alienation of farmland and clearing of bushland.

11. Experience from overseas: regular fires associated with CSG wells, pipelines and facilities; chemicals used in fracking shown to be toxic to humans; systematic contamination of groundwater with methane; increased incidence of earthquakes after fracking.

In summary, placing a full moratorium on CSG exploration until the science is settled and simultaneously putting the Government's energy in to driving renewable energy infrastructure would benefit all in our society and not threaten our water, food or air by contamination or depletion.

Add to this the fact that approximately 70% of mining interests in Australia are offshore-owned where profits also flow offshore. Currently, CSG miners in NSW have a royalty-free period to mine for the first five years of sinking a well, so the NSW State government is getting absolutely no return for the first 5 years.

The risk of intangible or immeasurable environmental costs such as the cost of aquifers ruined by toxic chemicals, spoiling drinking and irrigation bore water in the countryside, salination of land through changing water table levels, deaths of farm animals who eat contaminated grass as seen in 'Gasland', the wholesale clearing of forests to make space for grids of wells, the likelihood of gas leaks, explosions and fracking fluid expulsions under pressure.

There is also the fact that for the first 20 years of their operation gas wells produce as much greenhouse gases as coal-fired power stations with a combination of burning the gas and methane leakage, the prospect in urban areas of increased earthquakes and subsidence as in the US where CSG mining has been banned in some areas after causing building damage and health costs to people living nearby. The miners want to take the profit and have the community wear the environmental costs.

Finally, an overwhelming number of Australians want a moratorium on the coal seam gas industry, according to a new Galaxy poll. The poll of 1,048 people showed that 68 per cent of Australians support a moratorium on coal seam gas (CSG) until the full health and environmental impacts of disrupting water aquifers are known.

There is overwhelming support from the Australian people for a moratorium on this potentially devastating industry.
The polling showed that a moratorium is supported equally in cities, regional and rural areas in all states, and across age groups, with 70 per cent of those polled also want CSG mining banned outright in cities and towns.

Peter Meloy
Secretary
Central Coast Greens