

Submission on the Camden Gas Project Stage 3 Northern Expansion

Submission from
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Doctors for the Environment Australia is a voluntary organization of medical doctors in every state and territory working to minimise public health impacts from environmental damage. DEA has made submissions to both state and federal parliaments regarding coal seam gas mining citing significant risks to human health.

[http://parliament.nsw.gov.au/prod/parlment/committee.nsf/0/f96d076732225603ca25791b00102098/\\$FILE/Submission%200412.pdf](http://parliament.nsw.gov.au/prod/parlment/committee.nsf/0/f96d076732225603ca25791b00102098/$FILE/Submission%200412.pdf)

[http://dea.org.au/images/uploads/submissions/MDB CSG Senate submission June 2011.pdf](http://dea.org.au/images/uploads/submissions/MDB_CSG_Senate_submission_June_2011.pdf)

We would like to express our strong objection on health grounds to the proposal by AGL to proceed with Stage 3 of the Camden Gas Project (CGP), Northern Expansion.

We understand the following:

- Stage 3 comprises up to 66 wells in 11 locations in and around the Scenic Hills, comprising of 5 wells located in the Campbelltown LGA and 6 in the Camden LGA.
- Five of the well locations are in an area zoned for Environmental Protection (Scenic) and within which extractive industries and mines are prohibited.
- AGL argue that the project constitutes 'utility installation' under the definitions of the Environmental Protection zone and is therefore permissible.
- The application is being opposed by local government as not being consistent with the environmental values of the area, among other concerns.
- Gas gathering pipelines will link the proposed wells with the existing network associated with the previously approved Stages 1 and 2 of the Camden Gas Project and associated infrastructure such as access roads.
- The CGP currently consists of 144 wells, 89 of which are producing (AGL, October 2012).
- Approximately 85% of CSG wells in the CGP have been hydraulically fractured.
- AGL are hoping to reduce the need for hydraulic fracturing to 20% of wells via the technique of surface-to-in-seam (SIS) horizontal drilling. From the vertical surface well, horizontal wells may stretch out as far as 2.5km and under surrounding suburbs, 700 metres below ground.
- The clustering of 6 wells on the one well surface location is not a technique that has been used so far in the Camden Gas Project. Horizontal drilling is technically demanding as the seams are only several metres thick and are not level. 'Approximate thickness of Bulli Coal is 2-5m and of Balgownie Coal is 1-3 m' (*Phase 1 Groundwater Assessment and Conceptual Hydrogeological Model Northern Expansion of Camden Gas Project (December 2010)*).

- Laser and GPS will be used to guide the drilling.
- The Stage 3 expansion involves for the first time the Sydney Metropolitan area, in close proximity to existing and planned residential areas.
 - The subsurface project area under which the drilling may occur contains 61 schools and 67 pre-schools, kindergarten's and child care facilities. The subsurface area also includes the Campbelltown business district and Campbelltown Hospital and many suburbs. Some 150,000 people reside in the subsurface project area, with plans for new suburbs.

The NSW Branch of Doctors for the Environment Australia has prepared this submission on behalf of the wider organization in order to strongly object to this proposed development, which we believe would be detrimental to the health and well-being of current and future NSW residents. Health is not merely absence of disease, but is also determined by a range of factors such as clean air, safe food and water, uncontaminated land and socially cohesive communities with healthy natural environments. Our objections relate to impacts that have the potential to undermine these determinants of health:

1. WATER CONTAMINATION

Chemicals used in drilling and hydraulic fracturing, and contaminants released from the coal seam may include carcinogens, mutagens, endocrine disruptors, irritants, sensitizers and substances that may cause organ system damage. For some of these chemicals, no safe exposure levels have been determined for human health.

We note that the NSW government has ignored the advice of their own Parliamentary Inquiry into coal seam gas extraction, and is allowing hydraulic fracturing to occur despite the fact that chemical additives used for the process have not yet been assessed by our national chemical regulator NICNAS.

http://www.parliament.nsw.gov.au/Prod/parlment/committee.nsf/0/318A94F2301A0B2FCA2579F1001419E5?open&refnavid=CO4_1

AGL states it is planning to use hydraulic fracturing additives typical of those used in other CSG projects in NSW. The company has not yet specified which chemicals, but has committed to do so after Stage 3 is approved. This lack of full and open disclosure prior to approval, together with the lack of assessment of the chemicals by NICNAS potentially puts public health at risk. Contamination of ground and surface water has been documented in numerous unconventional gas operations overseas.¹⁻⁴

Much closer to home, a cluster of ill health that may be related to CSG extraction has developed in the Western Downs of Queensland. Residents

living in rural estates in close proximity to hundreds of CSG wells are experiencing a variety of symptoms including daily headaches, breathing difficulty, rashes and skin irritation after bathing, nose and ear bleeds, metallic taste, eye irritation, dizziness, nausea and vomiting. These symptoms are not specific if taken individually, but together they form a pattern of health complaints which display similarity with patterns reported in established gas fields in Canada and the US.¹⁻³

Lack of adequate baseline and ongoing environmental monitoring of air and water have made investigation of illness clusters such as this extremely difficult. NSW still has the chance to avoid some of the problems now being seen to arise in Queensland, by adequate regulation and exercise of the precautionary principle where there are significant unknowns in the risk to human health. The potential in this development for risk to health is arguably even higher as it is exposing a much more densely populated community.

In areas of other countries where unconventional gas development is occurring, public health leaders are calling for caution. For example, the Chief Medical Officer of Health in New Brunswick, Canada has emphasised the need for appropriate regulation and monitoring.

*"The Province should put in place monitoring networks for ambient air and water quality, as well as drinking water quality in the local areas expected to have an industry presence, in advance of industry development and continuing throughout the lifetime of development, production and post-production."*⁷

This is one of 30 recommendations from the report published this year which identifies numerous gaps in the regulation of unconventional gas development potentially putting public health at risk. The New Brunswick College of Family Physicians also supports a moratorium on hydraulic fracturing until such time as further research can demonstrate that the benefits of the industry clearly outweigh the risks.

"We are particularly concerned about potential contamination of public water supplies, air pollution resulting from fracking operations, disposal of radioactive wastewater, possible spills of toxic chemicals, the health of children and pregnant women, only enumerating a few. We're concerned because we know there has been a great deal of development right now in New Brunswick. There's a great deal of pressure as well for the government to go on with new energy sources. We are thinking this process is going really fast and there are still risks with this development. Unfortunately the benefits are not that big right now. We urge the government to put a moratorium on and wait until further studies show mostly that there are no health and environmental issues."

Dr. Anick Pelletier, President of The New Brunswick College of Family Physicians⁸

We note that some baseline testing of groundwater has been done for Stage 3 of the CGP, whereas there was none done for Stages 1 and 2. We would argue that all testing should be done independently and with the results publicly available. There should also be ongoing monitoring of water and air in the project area and surrounding suburbs.

AGL cannot give assurances that groundwater will not be affected. Although generally a geologically stable area, fault lines do run through it, between the coal seams and overlying clay.

The Response to Submissions Report reveals AGL's uncertainty regarding groundwater impacts such as the following statements on Page 35:

"Based on a review of previous studies undertaken, the assessment (the conceptual model) concluded that the presence of extensive and thick claystone formations that overlay the coal measures are likely to impede the vertical flow of groundwater."

"However, the assessment also identified that the possibility cannot be ruled out that major fault zones could provide a hydraulic pathway through claystone horizons and that some shallow groundwater impacts may be observed in close proximity to those structures."

These statements underline insufficient scientific knowledge regarding the subsurface consequences of Stage 3.

2. AIR POLLUTION

Air pollution may pose a serious threat to health. Volatile organic compounds (VOCs) and polyaromatic hydrocarbons (PAH) including the carcinogen benzene are released during unconventional gas operations, from venting, holding tanks and compressors. VOCs and vehicle emissions from the many truck movements required are precursors for the creation of ground-level ozone, exposure to which is a known risk factor for respiratory disease.

We understand:

- Baseline air quality measurements have not been undertaken for Stage 3. The EA from 2010 contains only general figures for the Macarthur area from 2007. This is a glaring omission.
- Well surface locations may be as close as 200m from a residential building. One well surface location in the northern part of Stage 3 will be only 690m from a monastery, and 620m from a religious retreat centre next door. There are 3 well surface locations near St

Gregory's College boarding school, the nearest being 320m from the school.

- In-field compression (to enhance the pressure of extracted gas from wells in the northern part of the project area) may be necessary due to the distance of the proposed wells from the Rosalind Park Gas Plant. AGL have not yet detailed this and will have to make a separate development application.

The potential risk to health of air pollution from unconventional gas operations has been documented in the scientific literature overseas. The following two studies from Colorado were undertaken in shale gas fields. We acknowledge that shale gas reserves are much deeper than coal seam gas reserves and that they require high volume hydraulic fracturing. Although the geology in the Camden Gas Project is different, the pollutants potentially released in the process are very similar. In terms of health impacts, the different types of unconventional gas extraction pose similar types of risks to human health. It is our opinion that these studies are therefore relevant and should be cautionary.

A study of air quality in a Colorado gas field used US EPA guidelines to calculate health consequences for those living in proximity to gas wells.⁵ Results showed residents living <1/2 mile from wells are at greater risk for health effects than are residents living >1/2 mile from wells. The non-cancer risk for residents <1/2 mile from wells was driven primarily by exposure to airborne trimethylbenzenes, xylenes, and aliphatic hydrocarbons. Increased cumulative cancer risk was also increased for those living nearby wells, mostly as a result of increased exposure to airborne benzene. Exposure to harmful air pollution was greatest at the time of well completion (fracking, flowback). Headaches, throat and eye irritation reported by residents during well completion activities are consistent with known health effects of many of the hydrocarbons evaluated in this analysis.

In another study, air sampling was done 1.1km away from a gas well pad before during and after drilling and hydraulic fracturing 16 wells over the course of a year.⁶ This well pad used a best practice closed loop drilling system where all fluids were piped straight to closed tanks on site. Methane, non-methane hydrocarbons (NMHC) and polycyclic aromatic hydrocarbons were detected. Some PAHs were at concentrations greater than those at which prenatally exposed children in urban studies had lower developmental and IQ scores. The authors conclude:

"In order to determine how to reduce human exposure for both those who work on the well pads and those living nearby, systematic air quality monitoring of natural gas operations must become a regular part of permitting requirements. It is apparent from what is presented in this paper that the NMHCs need far more attention not

only because of their potential immediate and long term chronic health effects, but also for their secondary indirect health and environmental impacts as precursors to ozone.”

In the Tara/Chinchilla CSG field in Queensland, preliminary independent air monitoring for methane by Southern Cross University found methane concentrations over 3 times as high as the highest level found outside the gas field. The highest methane level outside the gas field was 2.1ppm, and within was 6.89ppm. Analysis demonstrated the fingerprint of CSG. These results imply widespread methane leakage, not just localised leakage from one well or piece of gas infrastructure. Information on gases other than methane and carbon dioxide is not available, but the leakage of methane indicates the potential for additional airborne chemical exposures with the potential to harm health.

The US Environmental Protection Authority has already acknowledged the seriousness of air pollution from unconventional gas operations and has introduced new standards for the industry that will be phased in by 2015. These will include so called ‘green completion’ of wells.

“Natural gas is lauded as a cleaner-burning fuel than either coal or oil, but getting the fuel out of the ground can be a dirty process, especially given the widespread adoption of the technology known as hydraulic fracturing (‘fracking’). Concerns about toxic air emissions from previously unregulated fracking sites led to the U.S. Environmental Protection Agency (EPA) announcement on 18 April 2012 of new and updated air pollution regulations for these facilities and certain other elements of oil and natural gas production and transmission. Compliance with the new regulations is expected to result in major reductions in emissions of methane and volatile organic compounds (VOCs), particularly from new fracked natural gas wells.”⁹

3. COMMUNITY IMPACTS AFFECTING AMENITY, SUCH AS LAND SURFACE DISTURBANCE AND NOISE

We understand that each CSG well surface location will become a 100m x 100m well-pad, during the construction phase, 45m x 45m in the intermediate phase and 20m x 20m in the production stage. During construction heavy equipment, temporary buildings and the drill rig will occupy the pad. Once commenced, drilling continues 24 hours per day, seven days per week, for a month for each well by AGL’s estimate. The well pads will be floodlit at night and noise will occur around the clock. Further application for in-field compressor stations will entail permanent infrastructure and ongoing levels of noise.

Community noise has well established health impacts including sleep disturbance and poor academic performance.

[http://www.health.gov.au/internet/main/Publishing.nsf/Content/33165540CB3C78CBCA256F1900042E72/\\$File/env_noise.pdf](http://www.health.gov.au/internet/main/Publishing.nsf/Content/33165540CB3C78CBCA256F1900042E72/$File/env_noise.pdf)

This will be problematic particularly for the religious communities, but also for school students and residential areas.

4. MENTAL HEALTH IMPACTS

Industrialisation of this rural area, which was specifically set aside to form a rural backdrop for Campbelltown, may contribute to detrimental mental health impacts on local residents. Loss of visual amenity, increased vehicle and heavy truck movements on previously quiet streets, and decreased property values, and loss of a sense of control, are just some of the ways people may be affected.

Mental health is the second leading contributor to Australia's total burden of disease. We are aware that residents of communities in Queensland where CSG mining has commenced, experience anxiety, sadness and anger which diminish potential for good mental health. Loss of property values, loss of landscape and inter-community conflict contribute to these emotions resulting in feelings of helplessness and hopelessness.

The local council continues to voice opposition to coal seam gas extraction in the environmentally sensitive Scenic Hills on the grounds that it is not consistent with the values and planning objectives for the 7d(1)

(Environmental Protection - Scenic) Zone:

- a) to set aside certain land as a protected scenic environment
- b) to ensure that land will remain a rural environment providing visual contrast to the urban areas of Campbelltown, Camden and Liverpool
- c) to ensure that the inhabitants of Campbelltown will continue to have views of, and access to, a rural environment.'

(Campbelltown City Council, Agenda Summary, Planning and Environment Committee Meeting 11/12/2012)

5. CLIMATE IMPACTS

Accelerating climate change is a threat to the health of all Australians. Despite AGL's claims that it is "one of Australia's leading integrated renewable energy companies and is taking action toward creating a sustainable energy future", coal seam gas is a fossil fuel, and methane a potent greenhouse gas. Best practice to minimise fugitive emissions must be applied to all wells, pipelines and infrastructure. Even so, only 2-4% of gas needs to be lost as fugitive emissions to negate the greenhouse gas advantage that gas has over coal. Further independent scientific

research of the fugitive emissions from Australian CSG fields is urgently required. Increasingly it is becoming clear that CSG is much less “clean and green” than the industry insists and in fact may be a significant contributor to dangerous climate change.

SUMMARY

In summary, Doctors for the Environment Australia strongly objects to the Northern Expansion of the Camden Gas Project on the grounds that it presents unacceptable risks to the health of the residents of greater Sydney, via potential threats to water, air and land, as well as psychological and social impacts.

We call for the Stage 3 application to be rejected and for AGL’s Petroleum Production License to be suspended until a full assessment of the risks to residents is undertaken. This should entail a full health impact assessment, and be undertaken with transparency to the public, including oversight by experts with no conflict of interest beyond their concern for the health and wellbeing of the people of NSW. We suggest that this protection is the minimum that citizens should be able to expect from their elected representatives and we call upon the government of NSW to show leadership in protecting our environment and our health.

15th January 2013

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