

**Submission
No 696**

INQUIRY INTO COAL SEAM GAS

Organisation: OzEnvironmental Pty Limited

Date received: 7/09/2011

This Submission addresses the following matters:

1. Hydrogeological knowledge and assessment;
2. Looking beyond narrow 'short termism' when considering economic activity options;
3. The management of CSG production water, including salt;
4. Access arrangements;
5. Landowner compensation; and
6. The need to rewrite the Petroleum (Onshore) Act.

A strict precautionary approach needs to be adopted to ensure that the CSG industry is only permitted to operate if it can satisfy the fundamental principles of Ecologically Sustainable Development. The industry, by its own admission – see below - does not really know what the impact will be on the groundwater system – and this resource is one of the most precious in rural Australia and one that underpins a vibrant agricultural industry.

In addition, the CSG industry fails to provide adequate compensation to rural landholders and imposes on the landscape a spiders web of unattractive industrial infrastructure. (See photos on the internet of the Chinchilla, Qld landscape).

The spread of the CSG industry is insidious as farmers and others are being asked to accept infrastructure on their properties - and compromise their farming enterprises – for nominal financial compensation. At least in the case of a coal mine the proponent usually purchases the property and fairer compensation is usually received.

Governments are complicit in the advance of this industry before proper process and due diligence has been completed, all because of the attractiveness of the short term dollar. It is time to modify how we measure wealth, and to base our 'progress' on the adoption of a true triple bottom line approach where environmental, social and economic parameters are all properly accounted. The current GDP measure favours short term economic gain, no matter what the social or environmental costs. The development of the CSG industry is a classic case in point.

The policies, procedures and laws regarding the CSG industry need to be significantly tightened to safeguard:

- a) our environment, especially potential water and salt impacts;
- b) our rural social fabric; and
- c) our long term sustainable wealth generation capacity.



OzEnvironmental
*Delivering **true** progress*

Submission to
General Purpose Standing Committee No. 5
NSW Legislative Council.

Inquiry into Coal Seam Gas

7 September 2011

1. OzEnvironmental Pty Limited Credentials

OzEnvironmental Pty Ltd provides technical and strategic advice on industrial land use planning and corporate sustainability policy.

The Principal of OzEnvironmental Pty Ltd is Mr Warwick Giblin B Sc, Dip Env Stud, Dip Educ, FEIANZ. He is a leading environmental management practitioner with over 30 years executive experience in impact assessment, water, waste, biodiversity conservation, environmental education and as a Ministerial policy adviser.

Mr Giblin is also an elected member of the Council of the Royal Agricultural Society of NSW and was the Founding President of the Environment Institute of Australia & New Zealand (EIANZ) (NSW Division) - and now a Fellow. (The EIANZ is the professional association for environmental practitioners).

Mr Giblin's credentials relevant to this topic are outlined below:

- Prepared numerous environmental impact statements for mining and other industrial projects;
- Former adviser to the Governments of The Federated States of Micronesia and The Marshall Islands on environmental impact assessment and land use planning;
- Former Director of Environment Business Australia;
- Former member, NSW Catchment Areas Protection Board;
- Former member, NSW Total Catchment Management Interdepartmental Committee;
- Engineers Australia: Former Environmental Engineering Committee member;
- Standards Australia: Former Environmental Management Committee member;
- Conducted an extensive number of environmental audits of operating industrial facilities; and
- Former Director of Greening Australia (NSW).

OzEnvironmental clients include the Hunter Valley Wine Industry Association and the Basin Sustainability Alliance (Queensland), both of whom have major concerns about the triple bottom line sustainability of the coal seam gas industry.

2. Introduction

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3. General Comments

3.1 The regional hydrogeology is not known well enough

It is reasonable to conclude at the present time that wherever CSG mining is proposed (or already under way) throughout Eastern Australia the regional hydrogeology is inadequately understood.

This is clearly evident from studying a recent submission by Queensland Gas Company (QGC) to the Queensland Department of Environment & Resource Management (DERM) seeking amendments to the consent conditions for extraction in the Ruby area. In a document seeking a review of the original decision dated 12 July QGC acknowledges that:

- a) There is no regional groundwater model for the Ruby Area– the Queensland Water Commission is currently developing one (p33);
- b) QGC will be “better able to map groundwater contours” once the baseline bore assessments have been completed. The results from the monitoring of such bores is “many months” away (p33); and
- c) Information regarding the location and types of aquifers “will be much better” once baseline assessments are completed (p32).

Clearly QGC does not have accurate, quantitative information about the groundwater system that it will impact yet government approval is being granted. So how can the regulator accurately determine the risks and impacts? It cannot.

The NSW Government must avoid making the same mistakes as has occurred in Queensland.

What all CSG proponents, including those in NSW, should establish before deciding on the merits or otherwise of CSG extraction is:

- a robust, independently verified, regional model to evaluate impacts of aquifer dewatering and fracking practices;
- a specific local model to evaluate dewatering and fracking consequences;
- model outputs that quantify the anticipated drawdown and how it propagates laterally and vertically over time;
- Model outputs that quantify fracking and aquifer interconnectivity risks;
- a scientifically supported quantification of the long term changes to water quantity and quality in the aquifers; and
- all model predictions rated for detailed statistical sensitivity and uncertainty analyses.

Furthermore, state government regulatory agencies should be requiring such modelling and analytical work BEFORE there is any consideration of impacts.

The CSG industry is without doubt currently ‘learning by doing’. This is risky state of affairs and the industry should be told by Government to pause until the community and regulators know the facts about what the impacts may be on the groundwater regime, and how to adequately manage the salt mobilised and brought to the land surface.

In abovementioned Ruby example QGC proposes to construct 1,200 wells. Each well will have an area of disturbance of 1 ha during construction. Each megalitre of CSG water brings up approximately 5 – 8 tonnes of salt that was previously stored safely underground.

The paucity of detailed evidenced-based information is akin to ‘jumping into a pool of water head first without knowing how deep it is’. Hence this industry could potentially be about to cause major damage to the hydrogeology of the Great Artesian Basin, Australia’s main food producing catchment.

For instance, if all planned CSG development in Queensland and NSW located in the Great Artesian Basin goes ahead, then up to 350,000 megalitres (about two-thirds of the amount of water in Sydney Harbour) of associated water will be extracted per year, along with approximately 1.5- 2.0 million tonnes per year of salt.

This is 55% more water than is currently extracted. How resilient is the Great Artesian Basin to such additional stresses? We simply do not know, as is admitted by QGC in its comments mentioned above about the absence of a baseline regional groundwater model.

Based on a prudent, scientific approach, the CSG industry should be halted until there is accurate, quantitative data on exactly what the hydrogeology picture is. Then and only then can the impacts on the baseline environment be realistically determined.

3.2 The groundwater experts say we should be very cautious

The independent groundwater leaders in Australia are urging caution in how the nation approaches CSG extraction and development. See below regarding advice from Geosciences Australia and the National Water Commission.

In September 2010 Australia’s premier geotechnical organisation, Geosciences Australia (GA), released a review of potential groundwater impacts from CSG mining in Queensland’s Surat and Bowen Basins. GA concluded that ‘the overriding issue in CSG development is the **uncertainty surrounding the potential cumulative, regional scale impacts of multiple developments**’. GA also stated that the information provided in EIS documents is **not adequate for understanding the likely impacts of widespread CSG development** across the Surat and Bowen Basins; nor will any level of information or modelling that can be provided by individual proponents.

Any reasonable observer would surely deduce that GA's message is that the community cannot trust any models, and that we won't know what will happen till it has happened! Taken at face value, this is a totally unacceptable situation.

GA recommends a process for 'staged adaptive management of CSG development' along the following lines:

1. **Apply the precautionary principle**. Assume excessive groundwater extraction will have impacts. GA recommended that there should be explicit requirements to minimize and mitigate any groundwater impacts during gas production;
 2. **A regional-scale multistate and multilayer model of cumulative effects of multiple developments, and a regional-scale monitoring and mitigation approach** should be developed to assess and manage these impacts; and
- **Whatever modelling is undertaken, there is very high level of predictive uncertainty involved**, so proponents should consider actions to minimize potential impacts on water balances.

In addition, in December 2010 the National Water Commission (NWC) issued a Position Statement on CSG and Water. Inter alia, the NWC states:

Extracting large volumes of low-quality water will impact on connected surface and groundwater systems, some of which may already be fully or over allocated, including the Great Artesian Basin and Murray-Darling Basin.

Impacts on other water users and the environment may occur due to the dramatic depressurisation of the coal seam, including:

- **changes in pressures of adjacent aquifers with consequential changes in water availability;**
- **reductions in surface water flows in connected systems; and**
- **land subsidence over large areas, affecting surface water systems, ecosystems, irrigation and grazing lands.**

The production of large volumes of treated waste water, if released to surface water systems, could alter natural flow patterns and have significant impacts on water quality, and river and wetland health.

The practice of hydraulic fracturing to increase gas output has the potential to induce connection and cross-contamination between aquifers, with impacts on groundwater quality.

The NWC is concerned that CSG development represents a substantial risk to sustainable water management given the combination of **material uncertainty** about water impacts, the **significance of potential impacts**, and the **long time period over which they may emerge** and continue to have effect. Therefore, an **adaptive and precautionary management approach will be essential** to allow for progressive improvement in the understanding of impacts, including cumulative effects, and to support timely implementation of 'make good' arrangements.

A precautionary and adaptive approach to managing and planning for CSG activities is essential to enable improved management in response to evolving understanding of current uncertainties.

Therefore, the NWC strongly argues for the careful, transparent and integrated consideration of water-related impacts in all approval processes.

Clearly there is a strong and consistent message from GA and NWC. Let's do as they say!

3.3 NSW needs to adopt the fundamentals of pursuing genuine wellbeing and progress

NSW needs an explicit CSG policy that acknowledges that human wellbeing and the economy are dependent on healthy ecosystem services. Economic policies moving forward should be cognizant of environmental limits and the contribution environmental resources play in wealth creation.

The CSG assessment process needs to acknowledge that NSW's natural systems are often under stress and may reach an ecological threshold or tipping point where a major change of state occurs and the system will no longer function in the same way as before. Hence as part of any assessment we need to know the capacity of natural systems to absorb further disturbance or change.

3.4 There is no clearly defined strategy regarding how to manage the salt extracted from the aquifers.

Each megalitre of CSG water extracts approximately 5 – 8 tonnes of salt that was previously stored safely underground. How will we manage millions of tonnes of mobilised salt? There appears to be no settled answer yet. NSW needs robust answers to this before we embark on coal seam water extraction.

4. Community Issues: Access and Compensation Matters

Some of the material in this section has been sourced from the 'Mining Law in NSW Discussion Paper' prepared by the Environmental Defender's Office NSW, June 2011. The document is commended to the Committee.

4.1 Access Arrangements

Historically, the laws on minerals and petroleum have clearly facilitated the extraction of resources as quickly and as easily as possible. Indeed, mining in NSW (and Australia) has enjoyed a special status under the law since at least 1851, when the first mining legislation codified that the ownership of minerals vests in the Crown.

These laws give the CSG proponents undue leverage over landholders to ensure exploration activities and access arrangements are quickly established. It is time they were changed to give landowners a more equitable say.

The current provisions disadvantage the landholder in a number of ways:

- As disputes heard by the Land and Environment Court are costly, landholders seeking to object to access arrangements are disadvantaged financially when compared to large corporations with deep pockets. This hurdle may rule out some landholders obtaining a fair and equitable outcome;
- Geographical remoteness from Sydney and farm duties creates challenges for landowners to attend Court and preparatory legal meetings compared with CSG proponents; and
- If arbitration occurs, in practice the determination often relates to what conditions will be attached to access arrangements, as opposed to whether an access arrangement should be granted at all. There needs to be a recognition that access arrangements are unacceptable in some pre-determined areas, highlighting the need for proper strategic planning, including the development of no-go zones for CSG extraction.

4.2 Compensation

Once an exploration licence or production lease is granted under the *Petroleum (Onshore) Act*, the landholder becomes entitled to compensation for any compensable loss suffered, or likely to be suffered, as a result of the exercise of the rights conferred.

This Act provides that the holder of a petroleum title is “liable to every person having any estate or interest in any land injuriously affected, or likely to be so affected, by reason of any operations conducted”.

Compensation is a blunt tool that cannot always properly assess the variety of circumstances and motivations of landowners. For instance, it may be that a price can be determined for the value of the crops destroyed, or prevented from being planted, but there may also be land where no amount of compensation can place the farmer in the position he/she was in prior to CSG extraction. For example, there may be land areas of special spiritual, psychological or amenity value.

- *Landholders lives placed in limbo*

Politicians and bureaucrats need to understand and appreciate that from the moment an Exploration Licence is granted, the lives of affected landholders are placed in limbo.

They face many unanswerable questions about what might happen and how best to deal with the situation, for example, should they commit to capital improvements or will this be a waste of money. A great sense of uncertainty and anxiety is ever present.

The most insidious impact is the fact that the landholders’ capital investment in their properties is effectively frozen. Proximity to a CSG wellfield and the possible future development of CSG detracts buyers. Real estate agents freely admit that properties in such areas are not able to be sold at the usual market rates.

What of those landholders who need to sell because they have become too old or infirmed to manage a rural property?

What of those landholders whose life plan anticipated selling this property within the next few years?

- *Too narrow a definition of compensable loss*

The ambit of compensation in NSW is very limited, with NSW having the most complex and restrictive compensation regime, with its ‘compensable loss’ concept narrowly defined.

The key restrictions under the laws governing compensation for CSG impacts are: firstly, compensation is limited to impacts that occur on the surface of the land; and secondly, it is limited to the boundaries of the property.

The impacts of CSG highlight these limitations. In NSW, much of the CSG extraction and exploration activities are located in areas of high agricultural or environmental value. Any disturbances to aquifers, that is sub surface impacts, on farming enterprises can have serious ramifications.

Compensation arrangements should require the CSG proponent to extend compensation to loss of amenity, loss of opportunity or profits or decreased market value.

- *Unlevel playing field with proponent holding the power*

Another major compensation issue is that there will often be a clear bargaining disparity between powerful CSG companies and individual landowners.

Often the outcome reflects the power differential and negotiating experience of the two parties, rather than the achievement of a just agreement.

To redress this imbalance, landowners need a robust and transparent compensation regime with additional protections similar to Commonwealth land acquisition laws. For example, the *Land Acquisition Act 1989* (Cth) takes a more expansive and equitable approach, where the value of the land is taken to be the *greater of*:

- the market value on the day of acquisition; and
- the “net acquisition cost” of the new land to be purchased.

Significantly, the “net acquisition cost” includes the likely cost of buying a new area of land, *plus* expenses incurred by closing operations and reopening them on the new land, *minus* any substantial saving gained by relocation.

Below is an extract from page 23 of Santos’ submission to the Senate Rural Affairs and Transport References Committee Inquiry into Management of the Murray Darling Basin – Impact of Mining Coal Seam Gas, dated August 2011. It shows the compensation payments typically made by the Company, consistent with different levels of activity.

The Submission states the “compensation arrangements include two key elements: an initial payment covering the first 12 months of operations, plus any in-kind compensation (such as upgrading a road or restoring a fence), and an ongoing annual payment. The amounts of compensation vary depending on the extent of infrastructure on a property.” (page 23)

	Initial	Annual (indexed by CPI)
Significant: 40 wells, campsites, water management pond, flowlines, road access	\$280,000 + in-kind works	\$100,000
Mid range: six wells, campsite, communication tower, flowlines	\$44,000 + in-kind works	\$14,000
Minimal: one well	\$5,000 + in-kind works	\$1,500

Industry sources have reportedly advised that the revenue from one production well is approximately \$800K pa, with a well operating for approximately 10 years.

If this is so, and if the compensation payments stated above are typical of what is offered throughout the industry, then landowners would appear to be unfairly compensated, given the revenue generated.

Landowners are carrying the risk of:

- a) Disturbance and interference to aquifers ;
- b) Changes to surface water flow regimes;
- c) Disruption to farming enterprise activities (for instance well heads connected by roads and pipelines, production water storage facilities, construction camps, etc) and how that impacts on the movement of heavy, wide machinery, cropping and livestock activities;
- d) Loss of rural amenity;
- e) Loss of control regarding persons accessing your freehold land; and
- f) Visual and noise impacts.

5. Conclusion

In light of the matters outlined above, the State Government is urged to:

1. Impose a moratorium on all coal seam gas exploration and production until accurate and comprehensive information is known about regional groundwaters and potential impacts, and how extracted production water and salt may be sustainably managed.

Australia's leading independent experts on groundwater are clearly concerned that CSG development represents a substantial risk because of:

- material uncertainty about water impacts;
- the significance of potential impacts; and
- the long time period over which they may emerge and continue to have effect.

Given the overwhelming and unambiguous message from the independent hydrogeological experts, the NSW Government is urged to ensure the provision of good quality information before impacts are quantified and assessed.

2. Adopt the precautionary principle 'front & centre' in assessing all CSG proposals. The NSW community is relying on the State Government to safeguard the environment and protect its interests, in accordance with legislative responsibilities. NSW needs an overarching land development policy that acknowledges that human wellbeing and the economy are dependent on healthy ecosystem services. Economic policies moving forward should be cognizant of environmental limits and the contribution environmental resources play in wealth creation.
3. Rewrite the Petroleum (Onshore) Act. When drafted, this Act was a quick 'cut and paste' of the Petroleum (Offshore) Act and fails to give adequate recognition to the fact that on land there are freehold property owners, whereas at sea there are none. The rewrite of the legislation needs to reflect modern day, triple bottom line sustainability requirements.
4. Provide landholders affected by CSG proposals better legal standing in negotiations with companies on access and compensation payments. At present it is a unlevel playing field with farmers disadvantaged in the face of corporations flexing their economic, political and legal muscles.

In summary, OzEnvironmental Pty Ltd implores the NSW State Government to heed the advice of independent experts and adopt a **precautionary management approach**. Such an approach will allow for progressive improvement in the understanding of impacts, including cumulative effects, and to support timely implementation of 'make good' arrangements.

Thank you for the opportunity to comment. I look forward to seeing stronger and more effective Government leadership that delivers truly sustainable development, development that safeguards our rural landscape and its social fabric.
