

Submission
No 533

INQUIRY INTO COAL SEAM GAS

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Inquiry into Coal Seam Gas.

The Coast and Wetlands Society Inc welcomes the opportunity to make a submission to the Inquiry into Coal Seam Gas.

Issues relating to Coal Seam Gas have been given a very high profile recently. However, until recently it has been a sleeper issue, and the public at large, and, we suspect, governments, have been unaware of the nature and extent of the industry. The problem has arisen in the absence of appropriate mechanisms to address the issues involved, and indeed in the absence in many cases of a detailed understanding of the environments that could be affected by the expansion of the industry.

We have reached the situation where the majority of the State is covered by exploration licenses, and under those licenses the holders do, under existing legislation, have rights to conduct exploration over private and public land. Legislation to change this retrospectively is unlikely, but we would have to ask how was it that the Department was able to continue issuing exploration licenses without any questions being raised about the appropriateness of this.

The Inquiry is armed with comprehensive terms of reference, but before making submission in relation to some of them we would like to make some general observations.

Why the rush?

There has been what amounts to an unseemly haste in the rush by companies to secure rights over large areas of the state. What we have seen is akin to a gold rush mentality.

However, coal seam gas is not a perishable commodity. If not extracted today, it will still be there tomorrow; indeed if not extracted it will still be there for hundreds and thousands of years into the future. If it is a valuable resource now it is potentially an even more valuable resource into the distant future.

Is it worth risking environmental and social disruption for short term instant profits, in a situation where there is a great deal of uncertainty about the risk?

If it is appropriate to impose a 5 year moratorium on the expansion of marine reserves, so as to permit further research and assessment, then surely it is even more appropriate to exercise caution in relation into the uncertainties surrounding coal seam gas.

We note that a number of companies have recently contributed substantial funding to CSIRO for research into issues surrounding coal seam gas. If the companies recognize the need for research, why are they not waiting for the results of this research before pushing ahead with their plans? We welcome the commissioning of this research, but research is done when the answers are not known (otherwise it is just window dressing). Assuming that the research is not just for public relations purposes then it is

only commonsense that decisions are not made until the making of those decisions can be informed by the research.

Role of the Commonwealth

We are aware that the Senate is currently conducting an Inquiry (chaired by Senator Heffernan) into aspects of Coal Seam Gas. This is an indication of the public concern about coal seam gas but the direct role of the Commonwealth in resolving these issues, while not insignificant, is in many cases less than that of the States. The Commonwealth, for example, does not, on land, issue exploration licences.

The Commonwealth may have the power to be involved in issues in relation to

- Foreign investment
- Exports
- Triggers in the Commonwealth *Environmental Protection and Biodiversity Conservation Act*.
- Matters in the Murray Darling Basin.

Coal Seam Gas exploration and extraction do not, in and of themselves raise a trigger in the EPBC Act. On a case by case basis, at particular locations the specific triggers may become operative. This means that the Commonwealth may have effectively right of veto on some, but not all cases, although whether or not the Commonwealth Ministers would choose to exercise a veto is a matter of discretion.

This creates the potential for confusion and duplication of effort. There could be merit in the States and the Commonwealth seeking to produce a better collaborative approach, provide that any arrangements had adequate environmental protection and were open and transparent.

Companies –v- farmer

There is a perception, fostered by the media, that the issues surrounding coal seam gas are essentially between the companies and farmers. We would certainly not deny that there are substantial issues between these groups, nor that long term food security and agricultural sustainability are of absolute importance for the nation's future. However, we would not wish to see an outcome that was based on assuming that if farmers were happy then the problems were solved. There are many possible impacts on the natural environment which also need to be given weight in any assessment.

Other extractive industries

Issues about the expectations of owners of the surface and resource extraction arise in relation to all minerals. Conflicts over water use can also arise in many circumstances – as they have in NSW in relation to Cadia goldmine, or, in South Australia as they do at Olympic Dam. However, in most cases the surface footprint of other extractive issues is relatively small, and although extraction can be a major issue for an individual landholder, and there can be regional social and infrastructure concerns, there is not the regional scale impact on both agricultural and natural land resources which occurs with open cut coal extraction and potentially with CSG activities.

Terms of reference 1. Environmental and health impact of CSG activities.

a. Effect on ground and surface water systems.

The Coast and Wetlands Society Inc. has a particular interest in, and concerns about, the possible impacts of CSG activities on ground and surface waters.

Australia has a long history of exploitation of, and research into, groundwaters. Much of the research has been world leading, but there is still much to learn. Our knowledge of the location and structure of aquifers is still far from perfect. Details, both quantitative and qualitative, about connectivity between aquifers and between aquifers and surface waters are still sketchy. While there have been major advances in geophysical techniques for investigating aquifers, and development of increasingly sophisticated three dimensional mathematical models to explain flows in aquifers it would be our understanding that in many of the areas where exploration licences have been granted there has been little detailed prior study of aquifers.

Aquifers are usually important both ecologically and economically. Many human communities are reliant on groundwaters for both domestic and agricultural purposes. Reduction in pressure, flow and quality of waters in aquifers could have severe impacts on the sustainability, indeed the survival, of whole communities and their agricultural systems; a major part of the food essential for Australia is produced using groundwaters. Food and water are essential for human society so that we should be very certain that aquifers are safeguarded before permission is given for activities which have the potential to cause harm.

We acknowledge that industry will claim that there exist techniques for drilling and management post drilling which will prevent damage occurring and will preserve aquifer integrity. Certainly such techniques should be made mandatory, but even if they are potentially 100% successful in an ideal world, we do not live in an ideal world. Even in well regulated situations, with control measures apparently in place at all levels of organisation accidents will happen. Obviously it is to be hoped that the occurrence will be minimised but it cannot be completely eliminated. 'Deepwater Horizon', and, closer to home, the recent emissions of hexavalent chromium and of arsenic from the Orica plant at Kooragang Island stand as testimony to the fallibility of human systems.

Both the planning and approval process for CSG activities should be cognisant of the worst possible scenarios, even if the most stringent conditions are imposed.

Groundwater is essential for the maintenance of what are now referred to as Groundwater Dependent Ecosystems (GDEs); these involve many wetlands, springs and forests/woodlands. The more we study aquifers and the ecophysiology of surface communities the more widespread and extensive are our records of occurrence of GDEs.

In a sense the ultimate GDE is the aquifer itself. Underground waters are the habitat of a large number of organisms which make up the stygobiota. The stygobiota is a component of biodiversity – all levels of government in Australia have obligations arising from international treaties to conserve biodiversity. Globally there is increasing recognition of the stygobiota. In Australia considerable attention has been

given to stygobiota in WA, but very little in the eastern states, although there is no reason to suspect that stygobiota would not be widespread throughout Australia. In *Newcastle and Hunter Valley Speleological Society – v- Upper Hunter Shire Council and Stoneco Pty Ltd* [2010] NSWLEC48 the issue of whether or not stygobiota might be present within limestone was a major issue. The Court observed (at [172]) that stygobiota had not previously been considered in NSW, but that new understanding of the stygobiota meant that it was an appropriate matter to be raised.

That case was specifically about limestone, but the argument could be extended more widely to aquifers within other types of rock.

To the best of our knowledge stygobiota has not been given any attention in relation to CSG activities. In our view this is a critical area that needs to be considered in the approval process.

It is worth pointing out that the presence of methane in coal seams is the result of the activity of methanogenic bacteria, so that, at the very least, there is a bacterial biomass present. However consideration needs to extend beyond the coal seam itself to all other strata intersected during exploration and extraction.

In terms of surface waters, some surface waters are directly connected to aquifers, so that disruption of aquifers could result in changes to flow between aquifer and surface systems.

A major concern in regard to CSG activities and surface wetlands is the potential for salinisation. The water within coal seams is often highly saline, and the saline water will rise to the surface with the gas. The disposal of this salt, and many millions of tonnes is likely to be involved, poses a threat to surface ecosystems, how salt is to be managed has not yet been satisfactorily explained.

If CSG activities are to be considered in their totality then we also raise concern that export shipping facilities could require expansion of the Port of Newcastle which might involve impacts on the internationally significant Ramsar listed wetlands at Kooragang Island.

b. Effects related to the use of chemicals.

There has been substantial media and public concern about the use of chemicals in association with hydraulic fracturing. One of the issues is the lack of information both about whether the process is in fact carried out and of the chemicals involved. For some of the chemicals which might be involved it is not clear that there is authorisation for release into the environment.

It would seem from statements by the companies that there is no or little use, of chemicals in Australia, this needs to be clearly established, and if chemicals are to be used there needs to be open transparent approval processes.

The industry has also claimed that some of the BTEX chemicals which are of most concern are naturally occurring in coal seams. This may well be so, but absent CSG activities they would remain in the coal and not be brought to the surface where they create a risk to surface ecosystems and a management of disposal program.

Contamination of water resources from chemical use or salinisation is a risk to human communities which are dependent on those resources.

c. Effects of hydraulic fracturing.

We are aware of recent reports regarding exploration associated with fracking near Blackpool in northern England where claims have been made that a recent earthquake (a small earthquake, but in a region normally regarded as tectonically stable) was triggered by fracking. This may or may not be correct in this instance, but the claim cannot be dismissed out of hand, and the potential for tectonic activity should be considered. While earthquakes in the USA are considered most likely due not to the fracking process but to the reinjection of produced water back into the aquifer, this reinjection process has recently been touted as a solution to some of the issues in Australia.

Even in the absence of induced earthquakes, extraction of gas and water could result in gradual subsidence. (This has occurred with conventional natural gas extraction in the North Sea, which is associated with subsidence in the Wadden Sea region of the Netherlands).

d. Effects on Crown Lands, including travelling stock routes and State forests.

If extraction occurs there will be a need to connect well heads by pipes. There have been suggestions that pipelines could utilise travelling stock routes, to avoid impinging on private land.

This is of concern – TSRs continue to have a role in the management of livestock during drought, but are also extremely important for biodiversity conservation.

Construction of pipelines would involve fragmentation of the TSRs. As Australian vegetation is fire prone it is likely that there would need to be clearing adjacent to pipelines to provide asset protection zones (APZs). We are not aware of any discussion of the specific requirements for APZs associated with CSG activities but they are likely to further reduce the biodiversity conservation value of TSR.

The need for APZs around infrastructure is likely to be an issue with CSG activity on any Crown land or State Forest.

The industry claims in its media material that its footprint is minimal. After the establishment phase each wellhead occupies only a few square metres. This however underestimates the total footprint of not only the well heads but maintenance roads, interconnecting pipelines and the associated APZs. The cumulative effect is likely to be a considerable fragmentation of the environment, and, in the case of working forests, constraints and restrictions on how they can be managed.

Any proposals for assessment need to be carefully assessed and, if approved, conditions imposed to minimise the impacts discussed above. In addition the seasonal timing of work, and the methods employed would need to be such that any trenches did not become giant pitfall traps for wildlife. Potential impacts on Aboriginal sites would also need to be taken into account.

e. Nature and effectiveness of remediated required under the Act.

In the case of surface activities, remediation, in the form of revegetation could be required, but because of the needs for APZs this may not be a restoration of the original vegetation. To concentrate on the

small area of the well heads is to ignore the problem of disruption and fragmentation caused by the total infrastructure.

On farming land inability to practice 'broadacre' agriculture would have a substantial impact on productivity and economic viability. In natural ecosystems fragmentation would have considerable impacts on biodiversity.

In the case of damage to aquifers it is not clear to us what remediation might entail, and whatever it is whether it is feasible.

Given the very slow rate of movement of water in many aquifers we might have very considerable advanced warning of problems, but be unable to do anything about reversing them. Essentially we would be condemned to watching a very slow motion train wreck.

The experience of attempts of clean up of the Orica plume in Botany warns against the hubris of expectation that there will be a technological fix to every problem.

f. & g. Effect on greenhouse gas and emissions. & Relative air quality and environmental impacts compared to alternate fossil fuels.

Claims that CSG is a less polluting energy source than burning coal depend on there being no fugitive emissions of methane. Methane has a far greater greenhouse impact than carbon dioxide. If everything worked according to plan there would be minimal methane emissions – but reality may very well be different.

Even if all the methane consumed is combusted there would still be carbon dioxide emissions and so even if gas substitutes for coal at best there would be a reduction in the rate of increased effect.

This is an improvement, but only on a short-medium term basis.

We are aware of studies which suggest that in practice the impacts of CSG activities do not result in the claimed greenhouse emissions (Howarth, R. W., R. Santoro, and A. Ingraffea. 2011. Methane and the greenhouse gas footprint of natural gas from shale formations. *Climatic Change Letters*, 106.4 679-690 DOI: 10.1007/s10584-011-0061-5) and of transmission loss data compiled by the Australian Bureau of Statistics. There needs to be rigorous, independent evaluation of the greenhouse emissions associated with CSG.

TOR 2. The economic and social implication of CSG activities.

Coast and Wetlands Society Inc's major concerns and knowledge relate to the environmental issues. We will make only brief comment on this TOR.

a. Legal rights of property owners and property values.

It would seem to us that fragmentation of properties by roads and pipeline corridors would be an impediment to the conduct of agriculture and so would be likely to adversely affect property values. Damage, real or perceived, to water sources would also adversely affect property values.

It is clearly established legal fact in NSW that landholders of the surface land do not have ownership of mineral rights and that minerals would include both coal and gas.

Nevertheless it seems to us that there is a considerable public interest in protecting sustainable agriculture so that the approvals processes for both exploration and extraction should be required to give considerable weight to the protection of both agricultural land and natural surface ecosystems.

We are not convinced however that giving landholders the rights to the minerals under their land is necessarily a path to take. This would not necessarily secure agriculture – it would simply render the land more valuable, but if surface and mineral rights could be sold as a package then there would undoubtedly be landholders who would sell to the highest bidder without concern for long term agricultural productivity.

It is also the case that surface cadastral boundaries rarely coincide with geological boundaries. If, after full and proper consideration, exploitation of a particular resource was in the greater public good it would be appropriate that extraction be conducted as efficiently as possible, and to have a resource broken into pieces according to surface ownership would not necessarily be conducive to efficient management.

d. Royalties payable to the State.

Use of a non-renewable resource should be paid for at an appropriate rate – be that through royalties or a nationally applied resources tax. What does not seem to be a far sighted approach is to award royalty holidays as, on some accounts, has been the case for CSG.

e. impacts on local government

The development of CSG clearly imposes obligations on local government in the provision of infrastructure and services and yet local government has little say in the planning and approval process.

Given that license boundaries are not necessarily congruent with those of local government areas, and that local government planning departments may not be resourced to cover all the issues involved with CSG it would be inappropriate to give planning for CSG solely to local authorities. However, local government should have a much stronger role, in partnership with state government, in planning, assessment and regulation.

TOR 3. The role of CSG in meeting future energy needs of NSW

The Coast and Wetlands Society is not qualified to comment in detail on the TOR. However, we would argue that at best CSG will be a bridging fuel between dependency on coal to an economy largely dependent on renewables.

TOR 4. Interaction with other Acts

The resource exploration regime in NSW, essentially derived from mid 19th century mining legislation has not been brought into the 21st century. The inability of landowners and local government to have much influence on the exploration licensing regime does not reflect societal concerns. While resources

are clearly important to the economy and society we need, both in urban and rural areas, to be able to declare 'no go' areas, given current technologies, for exploration and extraction of certain resources.

TOR 5. The impact similar industries have had in other jurisdictions

CSG activities are extremely controversial in a number of jurisdictions. The film 'Gaslands', although presenting what could clearly be criticised as a biased or partisan approach by industry, nevertheless has served to highlight concerns and mobilizes public opinion.

It is those opinions which Governments are now obliged to address and this current Inquiry will be one mechanism for achieving this.

The Coast and Wetlands Society Inc. calls for an approach to coal seam gas extraction that adopts a precautionary approach. Appropriate investigation of the environmental, social and economic impacts of CSG extraction on communities should be undertaken and strategies for the proper management and mitigation of the extractive processes should be developed before any further ad hoc development continues.